ASTOR, LENOX AND TILDEN FOUNDATIONS 1904

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PHILADELPHIA LOCAL INSPECTORS REVERSED.

Mr. Robert H. Rodie, supervising inspector of the second district, has reversed the decision of the local inspectors of steam vessels at Philadelphia in revoking the license of Henry R. Truitt. Truitt, who was engineer of the tug F. A. Churchman of Philadelphia, demanded an advance of $15 per month and refused to work when it was not granted. The local inspectors of Philadelphia found him guilty of violating section 4449 of the revised statutes, namely, wrongfully and unreasonably refusing to serve in his official capacity as a licensed engineer. This is the statute upon which James A. Dumont and Thomas H. Barrett, local inspectors of the port of New York, revoked the license of Joseph Cornell, a marine engineer employed by the Newton Creek Towing Co., the circumstances of which were published in the last issue of the Review. Cornell had also demanded an increase of wages which was denied and he refused to work. In his case, as in Truitt's case also, action was taken under orders from the Marine Engineers' Beneficial Association, which had fixed a general schedule of wages to be submitted to employers. Supervising Inspector Rodie, however, as stated, has revoked the decision of the local inspectors at Philadelphia in Truitt's case. His findings, as shown in the following letter to Mr. Truitt, are:

"In the matter of your appeal, dated June 4, 1903, from the decision of the United States local inspectors of steam vessels of Philadelphia, who on June 2, 1903, revoked your license as engineer for violating the provisions of section 4449, revised statutes, namely, wrongfully and unreasonably refusing to serve in your official capacity as a licensed engineer, I have carefully considered the testimony taken before the local board of inspectors at Philadelphia on June 1, 1903, and other documentary evidence which form a part of the evidence in the case, and the following facts and conclusions are found and decided:

"First—Under date of May 19, 1903, you wrote a letter to Mr. Churchman as follows: 'On and after June 1, 1903, the wage scale for your tug is $80 per month, and I will expect same. I await reply.'

"Second—Mr. Churchman testified that he received said letter at 9 o'clock on the morning of May 21.

"Third—On Friday night, May 29, you wrote a letter to Mr. Churchman which was mailed May 30 at 1:30 a. m., as follows:

"'Mr. F. A. Churchman, Dear Sir:—I wish to inform you that I am not satisfied with my present wages, and ask that they be raised to $80 a month, to take effect June 1, 1903, and hope that this will be satisfactory to you, but if you do not see fit to grant this please accept this as my resignation. Thanking you for the past, I remain, yours, H. R. Truitt.'

"Fourth—Mr. Churchman states that he received your letter of May 29 at 8:40 a. m., June 1.

"Fifth—On May 28 Mr. Churchman wrote you as follows: 'I desire to say in reply to your favor of the 19th inst., in which you demand after June 1, 1903, a wage scale adopted by the Marine Engineers' Beneficial Association of $80 per month, and in which you say you will insist upon that rate of wages per month, that I cannot accede to your demand. I cannot afford to pay you more than your present wages of $65 per month, as my business will not warrant me to increase your salary. Yours, F. A. Churchman.'

"Sixth—On May 30 you received Mr. Churchman's letter saying that he could not accede to your demand.

"Seventh—Capt. Eli Watts testifies that on May 30 he knew you were going to resign.

CONCLUSIONS.

"First—While your letter dated May 19 did not state that you would resign in case Mr. Churchman refused to pay you $80 per month, I am of opinion it carried with it the sense that you would not serve for less than $80 per month.

"Second—Mr. Churchman took seven days or more to reply to your demand, which left you in ignorance until May 30 as to what his action would be; therefore the loss of time in receiving your resignation is the fault of his negligence to reply promptly to your letter of May 19.

"Third—Your second letter to Mr. Churchman, containing your resignation, is not the one upon which to decide whether you gave reasonable notice of your intention to resign, and had Mr. Churchman given you notice that he would not pay $80 a month without waiting the length of time he did there is no doubt in my mind that he would have received your formal resignation at an earlier date.

"Fourth—In Capt. Watts' evidence there is an acknowledgement that he knew on May 30 that you intended to refuse to serve in your official capacity on June 1, 1903, unless your wage was increased to $80 per month; and it was not necessary to try you in your official capacity on June 1 by ringing bells in order to know that you did not intend to serve.

"Pursuant to section 4452, revised statutes, upon the facts and conclusions above found, I hereby reverse the decision of the local inspectors at Philadelphia and order your license returned to you."

RECEIVER FOR UNITED STATES SHIP BUILDING CO.

Judge Kirkpatrick of the United States circuit court at Newark, N. J., decided that the United States Ship Building Co. is insolvent and that its directors had failed to take proper steps to protect the bondholders. He accordingly announced his determination to appoint a receiver for the company, and appointed James Smith, formerly United States senator, to that office.

The reorganization committee has a majority of both stocks and bonds of the company deposited in favor of its plan for reorganization and it will not take long to get it ready to submit to the receiver. Four-fifths of the preferred stock, a majority of the common stock, all the second-mortgage collateral bonds and two-thirds of the first-mortgage bonds will be voted in favor of reorganization, so that the receiver will have chiefly to consider the equity of the plan.

The United States Ship Building Co. was organized June 17, 1902, with a New Jersey charter, which gave it authority to construct ships and engines and manufacture armor plate, guns, iron, and steel products. Its capital stock consists of $25,000,000 common stock and $20,000,000 6 per cent. preferred stock, all issued. Its funded debt of $24,500,000 consists of $14,500,000 sinking fund 5 per cent. gold bonds and $10,000,000 collateral and mortgage 5 per cent. bonds, due in 1922. The properties of the company include the Bath Iron Works, Bath, Me.; Eastern Ship Building Co., New London, Conn.; Moore, Sons & Co., Elizabeth, N. J.; Bethlehem Steel Co., Bethlehem, Pa.; Canda Manufacturing Co., Carteret, N. J.; Hyde Windlass Co., Bath, Me.; Crescent Ship Yard Co., Elizabethport, N. J.; Harlan & Hollingsworth Co., Wilmington, Del.; Union Iron Works, San Francisco.

In the plan proposed by the reorganization committee it is proposed to reduce the capitalization from $81,686,264 to $43,000,000, get $2,000,000 cash capital from the second mortgage bondholders, and start anew with nearly $39,000,000 of "water" squeezed out. The feature of the plan which led to opposition and finally to the appointment of a receiver, was that clause which gave preferential treatment to the holders of the $10,000,000 collateral second-mortgage bonds, which were chiefly held by Charles M. Schwab, president of the United States Steel Corporation. In return for Mr. Schwab and his associates advancing $2,000,000 in cash, they were to receive all of the $12,000,000 first mortgage 5 per cent. thirty year gold bonds proposed to be issued by the reorganization committee, while the holders of existing first mortgage bonds were to receive 7 per cent. non-cumulative preferred stock. In addition a voting trust to continue seven years, was to be formed. The members of the trust were to be Charles M. Schwab, George R. Sheldon, Max Pam, Charles W. Wetmore and James H. Reed of Pittsburg.

MR. COREY TO MANAGE STEEL CORPORATION.

On two or three occasions the Review has stated that Mr. Charles M. Schwab's tenure of office as president of the United States Steel Corporation was a limited one; but the Review is frank enough to admit that he has held the office longer than it expected he would. Of course during a great part of the time he has not been actively concerned in its management. His health has been his first care, as it should be that of all men. He has not now retired, but the active duties of president of the Steel Corporation have been taken from him. The formal announcement was made by Mr. Richard Trimble, secretary of the Steel Corporation, on Tuesday, in the following terms:

"In consequence of the continued ill health of the president, he has requested the appointment of an assistant to perform the active duties of the presidency, and at today's meeting of the finance committee Mr. W. E. Corey, president of the Carnegie Steel Co., was appointed to such position."

It is now learned that Mr. Henry Frick was last March approached and tentatively offered the presidency of the great corporation. He positively refused to consider it. The curious thing is that the appointment of Mr. Corey to this important office caused no stir in financial circles whatever, so clearly had the events of the past few weeks presaged it. Mr. Corey has been connected with the steel industry since his sixteenth year. His first position was in the laboratory of the Edgar Thomson steel works, where he imbibed a fund of practical knowledge which he has ceaselessly striven to develop and apply. He later entered the order department of the Carnegie works at Homestead, where he steadily advanced until he succeeded Charles M. Schwab as president. An important invention of Mr. Corey was the invention of the Carnegie reforged armor.

The Union Iron Works, San Francisco, has been awarded a contract for a steel steamer by the Wilder Steamship Co. of Honolulu for the Hawaiian islands trade.

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NEW TURBINE STEAMERS.

Attention Directed to Large High-class Passenger Vessels of this Type Now Being Turned out on the Clyde—Loss of big French Ships—Light Load Line Question.

Glasgow, June 22.—The new turbine steamers, built during the winter on the Clyde and now coming into evidence, are of special interest in ship building circles. The Queen, the turbine steamer which Messrs. William Denny & Bros. of Dumbarton built, and the Parsons Co. engined, for the Southeastern & Chatham Railway Co., ran her official trials on the Firth of Clyde a few days ago. This vessel marks an important development in cross-channel steamers, which have hitherto been of the paddle or ordinary twin-screw type, with reciprocating engines. The Queen is a turbine steamer and is built very much on the lines of the turbine boats which have already been so successful on the Clyde, though somewhat larger. She is 310 ft. in length, 40 ft. in molded breadth and 25 ft. in depth, with a complete awning deck. In large deck-houses on the awning deck a number of special cabins are provided for passengers. The smoking-room, framed in waxed oak and upholstered in leather, is amidships. There is a promenade deck extending out to the ship's sides, which shelters the awning deck. The ladies' accommodation is in a large apartment on the main deck, framed in oak and enameled pine. In the restaurant tables are provided for fifty passengers. On the upper deck there are twelve staterooms and two special royal staterooms. The ordinary staterooms are finished in white enamel with red figured cretonne. The royal staterooms are in white, richly ornamented. The second-class accommodation is aft, while the crew are berthed on the lower deck aft, and the officers and engineers on the main deck amidships. For convenience in canting and backing in harbor the vessel is fitted with a large bow rudder, worked by steam steering gear. Special arrangements have been made for getting the boats out and in quickly, the idea being to carry them outside at all times, except when coming alongside the berthing stage.

The machinery of the Queen consists of Parsons' turbines, three being fitted on three separate lines of shafting. In maneuvering the center shaft runs free, the two side shafts then taking the place of ordinary twin-screws, and the maneuvering power is in every respect as good as in ordinary twin-screws, while in going astern there is none of the objectionable vibration which is to be felt with the most modern twin-screw balanced arrangement. The center turbine is high pressure and the two side turbines are low pressure. When going ahead in ordinary work the steam is admitted to the high-pressure turbine, and after expansion there passes to the low-pressure turbines and then to the condensers, the total ratio of expansion being about 125-fold, as compared with 8 to 16-fold in triple-expansion reciprocating engines. At the ordinary steaming speed of the Queen the revolutions of the center shaft are about 700 and of the two side shafts 500 per minute. This velocity implies the adoption of propellers of small diameter, and the utmost care is necessary in balancing these, so as to obtain full advantage of the absence of vibration obtained by the adoption of turbines. When going full speed ahead all the lines of shafting are in action, but when coming alongside a quay, or maneuvering in or out of harbor, the outer shafts only are used, thus giving the vessel all the turning and maneuvering efficiency of a twin-screw steamer. Inside the exhaust end of each low-pressure turbine cylinder is placed an astern turbine, controlled by slide valves operated by combined steam and hydraulic reversing engines. The valves admit steam directly into the low-pressure turbines, or into the reversing turbines. When the vessel is going astern the center turbine revolves idly in a vacuum, its steam-admission valve being closed and its connection with the low-pressure turbines also closed by non-return valves. Steam is supplied by two double and two single-ended boilers, constructed by Denny & Co., the working pressure being 150 lbs. One feature on board the Queen is the absence of hot cinders and dust. The funnels of the latest Dover and Calais steamers are fitted with appliances by which the decks can be kept as clean as those of a yacht. On the measured mile the speed developed was 21.76 knots, and with this builders and owners expressed themselves highly satisfied. An interesting feature of the trials consisted of driving the vessels ahead at 20 knots and then reversing the turbines to full speed astern. This showed that she could be stopped dead in 1 minute, 7 seconds, in 129 fathoms, or exactly two and a half times her own length. The Queen has now been sent round to Dover.

Another turbine steamer, Brighton, also built by Wm. Denny & Bros., has just been launched for the London, Brighton & South Coast, and the Western of France railway companies' Newhaven and Dieppe service. She is very similar in general appearance to her predecessor, the Arundel, but she embodies a number of improvements on that vessel which have been rendered possible by the adoption of the turbine system of propulsion. The propelling machinery consists of three sets of turbines, manufactured by the Parsons Marine Steam Turbine Co., supplied with steam from boilers of the Scotch type constructed by Denny & Co. The arrangement of the turbines is similar to that fitted to the King Edward and Queen Alexandra, with so much success by the Parsons Co.—three shafts with five propellers, the center shaft being fitted with one propeller and the two side shafts with two propellers each. This vessel is the fourth built by Denny & Bros. for the Newhaven and Dieppe service and the seventh for her owners. The Brighton is practically a repeat of the Arundel, the last steamer they built for this service, except that she is fitted with turbine machinery instead of ordinary engines. Last year the officials of the two railway companies were so favorably impressed with the Queen Alexandra that they recommended the adoption of the turbines. The builders had every faith the results would be to their entire satisfaction. If there had been any doubt whatever on the subject it has been dispelled by the trials of the Queen, which were concluded the previous day.

LOSS OF FINE SAILING SHIPS.

The large French ship Duguay Trouin, which has met with disaster, is insured for £22,000. She was bound from the United Kingdom to the west coast of South America and back to Europe, and is supposed to have been damaged in the recent storm at Valparaiso, in which the Pacific liner Arequipa and the Liverpool ship Foyledale were totally lost. The Duguay Trouin is of 2,557 tons, is owned at Nantes, and was built last year at Bordeaux. Many fine sailing ships built in France during the last few years have met with disaster. The missing vessels Commandant Marchand and Du Couedic were both large new Nantes-built ships. The latter had a fresh insurance of £20,000 effected upon her cargo of grain from San Francisco to Sydney. About twelve months ago underwriters paid a total loss upon the large French ship Charlemagne, built at Nantes the previous year, which was posted as missing. She was bound from Noumea to Havre. The Oliver de Closson last February stranded at Long Branch while on a voyage from Plymouth to New York. She was also built at Nantes in 1901 and insured for £21,000, and although she was subsequently floated the bill for repairs and salvage expenses cost the underwriters £10,000. These disasters to French ships have fallen heavily upon London underwriters.

LIGHT LOAD LINE QUESTION.

Great interest is taken here in the report of the select committee of the house of lords on the light load line. The report states that it cannot be said to be proved that vessels in large numbers are unseaworthy because wanting in ballast. While such vessels are undoubtedly difficult to manage in rough weather, the number of accidents seems to be smaller in proportion than to ships in cargo. The committee, in view of the evidence which they have received with regard to the danger caused by the shifting of under-deck ballast, recommend that regulations as to securing ballast should be drawn up and enforced by the board of trade. They also deprecate most strongly the practice of throwing over ballast before a vessel arrives at her destination, and advise the board of trade to issue a warning not only to ship masters, but also to ship owners who give orders to this effect. The committee are unable to recommend the adoption of a light load line, because in their opinion there has been no loss of life, such as was supposed to exist when the deep load line became law, sufficient to justify legislation of this restrictive character, which would of necessity press hardly upon ship owners. The committee consider that the board of trade has power, under the merchant shipping act, to detain any British or foreign vessel from sailing in an unsafe condition. The committee find that the board of trade, whilst strongly opposed to any fresh legislation at the present time—that the evil of under-ballasting is being done away with—yet consider that it is possible to make further improvement in the ballasting of ships. The committee relies upon the board of trade to use the powers already conferred by parliament to prevent the improper or insufficient ballasting of ships. It will be the duty of the board to apply at once to parliament if at any future date they consider any extension of their powers necessary in the public interest.

The Dominion government has announced to the directors of the Dominion Iron & Steel Co. that there will not be any change or addition to the tariff during the present session. An extension of the bounties will be made in order that the manufacturers may receive the same bounty on steel manufactured from Canadian ore as on that manufactured from foreign ore. The iron and steel manufacturers asked that the bounty on pig iron from other than native ore be increased from $1.00 to $2.70, and that the present bounties not be scaled down until 1907. The effect of the increase stated would be to place Newfoundland iron, which is used by the Dominion Iron & Steel Co. on the same footing as the native ore. The company in question had also been pressing for duties on steel rods and steel plates over 30 and up to 50 in., and skelp steel that enters into the manufacture of pipes. These classes of material are at present exempt from duty.

The new marine barracks at the Naval Academy, Annapolis, are to be lighted by electricity, generated by a motor-generator set consisting of a 100 H. P., D. C. motor mounted on the same bed plate with and direct-connected to a 60-kilowatt, two-phase alternator. The current will be generated at 1,100 volts and transmitted across the river and there transformed to 440 volts. These machines have recently been ordered from the Westinghouse Electric & Mfg. Co., together with the usual switchboard and auxiliary apparatus.

Bids were opened by the navy department a few days ago for the construction of the gunboat Paducah. Two bids were submitted—one from the Gas Engine & Power Co., Morris Heights, N. Y., for $355,000, and one from the Townsend & Downey Ship Building & Repair Co., Shooter's Island, N. Y., for $377,000. The board of construction and repair has recommended that the bid of the Gas Engine & Power Co. be accepted. This company lately obtained the contract for the Dubuque, sister to the Paducah.

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DELAWARE RIVER SHIP BUILDING.

Philadelphia, July 1.—A largely attended special meeting of the stockholders of the William Cramp & Sons Ship & Engine Building Co. was held on Thursday last and the board of directors, in accordance with plans under way for some time past, was authorized to increase the capital stock from $5,000,000 to $0,250,000 and the bonded indebtedness from $1,800,000 to $7,500,000. The expected opposition to the increase developed, two stockholders, representing 750 shares, voting against the proposed recapitalization plan. Thirty-two thousand shares voted in favor of the plan. Assuming that an injunction against the plan, which has been asked for, is not granted, the financing of the increased capital and bonded indebtedness will be attended to by Drexel & Co., bankers, who, it is understood, have already completed arrangements for it.

On the day following the meeting of the stockholders the equity suit of the minority stockholders who object to the recapitalization plan was called for hearing in the court of common pleas. The objecting stockholders are John W. Grange, formerly a member of a stock brokerage firm, and Andrew H. McNeal, formerly owner of an iron foundry at Torresdale, Pa. According to the agreement between the Cramp company and Drexel & Co., who undertook to underwrite the loan, the banking house was to form a syndicate of persons to purchase a series of the ship building company's notes, amounting in the aggregate to $5,000,000, with interest at 5 per cent. and maturing in annual instalments, running over a period of twenty years, and to be secured by the deposit, with a trustee, of the Cramp company's mortgage bonds. The arrangement provides that these notes are to be sold at 90 per cent. of their par value and a bonus of 20 per cent. of the par value of the notes in the capital stock of the company is to be given to the purchasers. The compensation of Drexel & Co. for their services in negotiating this loan and putting the scheme into effect was fixed at $250,000 of the capital stock. The objecting minority stockholders contended that the issuance of the stock in the manner proposed would be contrary to the constitution and laws of the commonwealth of Pennsylvania. They also found fault with the commission to be paid Drexel & Co., which they characterized as grossly exorbitant. They contended that if the scheme was allowed to be carried out that capital stock of the ship building company of the par value of $1,000,000 would be issued as a bonus without any consideration being paid therefor; capital stock of the par value of $250,000 would be given to Drexel & Co. for less than the par value thereof, and notes and bonds of the company would be issued to the amount of $5,000,000 for a consideration of but $4,500,000.

A large number of witnesses were examined at the hearing, including John W. Grange, one of the complainants (Andrew H. McNeal, the other complainant, did not appear in court), Charles H. Cramp, president of the ship building company, Charles T. Taylor, secretary and treasurer, Samuel Dickson, lawyer, of the board of directors, Edward J. Stotesbury, of Drexel & Co., and George F. Baer, president of the Philadelphia & Reading.

The testimony of Samuel Dickson, lawyer, one of the directors of the Cramp company, went to show that the ship building company had a floating indebtedness of upward of $4,000,000 which had been incurred, not in the ordinary course of business, but in the enlargement of the plant. The company had also been back in payment of its supply bills, and the maturing of these obligations necessitated considerable haste in procuring loans. At one time the company was in difficulty about paying the wages of its employes, for which there was not sufficient capital on hand. In the opinion of Mr. Dickson it was necessary for the safety of the company that the loans with Drexel & Co. be allowed to be consummated.

Mr. Stotesbury of the voting trusteeship formed last May, and who, on behalf of Drexel & Co. attended to the details of forming the loan syndicate, testified that in all his experience in the financial world and in negotiating large loans and forming syndicates he never had such a difficult time to induce individuals and institutions to advance money as he did in the Cramp loan. No private parties, banks or trust companies desired to advance the money. On the contrary, they were very chary when the matter was broached and tried to avoid connection of any kind with the proposed scheme. Mr. Stotesbury had tried to interest a New York concern, but after a short consideration of the matter the company declined to take up the loan. It was then, the witness said, that he went around pleading with financial men and institutions that they should make the loans desired for the credit of the city of Philadelphia, if for no other reason. The Cramp plant was the largest in the world, built warships for the United States navy and foreign nations. This business for the government, he pleaded, should arouse patriotic feelings and should open the pocketbooks of all local financiers to help the company out. He also argued that it would be a disgrace to the city of Philadelphia if this company were permitted to become bankrupt and get in a position where it could no longer continue to run the historic plant on the Delaware.

The testimony of George F. Baer and other prominent financial men was in similar vein. John G. Johnson and Richard C. Dale were counsel for the ship building firm and P. K. Erdman for the complainants. In the argument to the court counsel for the Cramp company emphasized the fact that all of the stockholders--two excepted—had approved the plan of recapitalization; that under its charter the ship building company had a right to issue stock in compensation of those who had rendered it service, whether it was called a bonus or commission. Mr. Erdman, for the complainants, contended that the plan was illegal under the laws of Pennsylvania. The court, consisting of three judges, reserved its decision.

Work is very active at the Cramp yards, both in repair and construction lines. Extra efforts are being put forth to have the cruiser Pennsylvania ready for launching by about August 25, and work on the Turkish cruiser Medjidia has advanced so far that July 25 has been set as the date of launching. The Medjidia will go down the ways with her masts and cross-yards in position and her pilot house and bridges complete. She will, in fact, be almost ready to start on her maiden voyage. Many distinguished persons will be present at the launch.

The new oil tank steamer Larimer, built for the Guffey fleet by the New York Ship Building Co., fulfilled every requirement at her trial trip last week and was turned over to her owners. Saturday the Larimer left for Sabine Pass, Tex., and accompanying her was Charles C. Hehl, Philadelphia agent of the Guffey company, who goes south to remain some time for the benefit of his health. The iron work of the new "pickling" building at the New York Ship Building Co.'s yards is up and the brick work will be started this week. Two large cranes will be installed in the building when completed, to handle steel plates. The cranes will be furnished by Pawling & Harnischfeger of Milwaukee. The addition to the draughting building is practically complete and occupied. The fire boat ordered for New York city will be launched within a week or two.

Officials of the Neafie & Levy company are gratified at receiving the contract from the government for building four vessels to be used in connection with submarine defenses. The vessels will be each of 750 tons and the contract price is $122,000. Two tugs will be launched during the coming week from this yard. Efforts have been made to complete the tugs as speedily as possible so that room would be had to stretch the keels for ten iron vessels which the company has recently contracted for. It is believed that the laying of the keels of ten vessels—not all of them large, of course—within a month by one firm, which the Neafie & Levy Co. must do to complete its contracts within a specified time, is unprecedented in American ship building.

Joseph L. Ferrell of 2220 Race st., Philadelphia, was recently awarded the Elliot Cresson gold medal by the Franklin Institute of Philadelphia for his discoveries and inventions in connection with a process of protecting wood from fire. The Franklin Institute, after an investigation lasting eight months, in which Mr. Ferrell's methods were thoroughly tested, declared his fire-proofing process to be the most perfect yet submitted. This fact has proven of deep interest to ship builders, naval constructors, and in short almost everyone who uses wood in ships, mills, wharves, shops, etc. A stock company has been organized, under the name of the Ferrell Flameless Wood Co. to exploit the new process for commercial purposes.

The American Dredging Co., with headquarters in the new Merchants' & Miners' building, this city, has been building at its Camden works a number of dumping scows, as well as new dredging machines. Last week the company began the work of dredging a 26-ft. channel in the Schuykill river. The work is being done for the city of Philadelphia and the dredging company will receive $400,000 for it. The company is also doing extensive work on the Delaware river channel.

The Roberts Steam Piston Packing Co. recently received a letter from Superintendent J. M. Blankenship of the Merchants' & Miners' Transportation Co. of Baltimore, in which he says: "During the past ten years we have put seventeen of your rings in ships of this line and have always found them to be satisfactory." This is but one of a large number of steamship companies using the Roberts products.

Among improvements being made to its plant by the Atlantic Works, Incorporated, Philadelphia, are the erection of a two-story factory, 180x63 ft.; a blacksmith shop, 32x32 ft., and a boiler house 28x50 ft. The Atlantic company's wood-working tools are popular in ship yards and other establishments and the increase of business has necessitated the enlargement of the plant.

The Seaboard Steel Casting Co. of Chester, Pa., which furnished the large stockless anchors for the steamer Minnesota, one of the Hill vessels building at New London, Conn., will furnish similar anchors for the twin vessel, the Dakota, now being constructed at the same place. Work at the company's Chester plant is very active.

The Standard Roller Bearing Co. recently took over the interests of W. S. Rogers in the Ball Bearing Co. of Maine. The Standard is giving much attention to the manufacture of thrust bearings for propellers, turbines, etc., and is having an increased demand for them from ship builders and manufacturers.

"Hulks, sir, is only fit for coals," said an old tar when asked whether sailors preferred to be housed in the old frigates or in barracks. England has done what the United States contemplates doing—established its bluejackets in barracks. At Davenport and at Chatham the men have been turned over to the new quarters, and Portsmouth is shortly to follow.

At the summer meeting of the Institute of Naval Architects, held in Belfast last week, Admiral Cleveland, retired, deprecated a large expenditure for coaling ships, saying that "oil will be the future fuel of warships and experiments in this direction are being carried on by the admiralty with great success."

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THE SUPERVISING INSPECTORS.

They are after the Vessels Propelled by Naphtha, Electricity, etc.—Proposed Changes in Regulations will not be Recommended for Some Time Yet.

Washington, July 1.—It is the consensus of opinion of members of the board of supervising inspectors of steam vessels, and this statement is made on excellent authority, that even vessels under 15 tons of the electric and naphtha kind should be subjected to the rules and regulations governing vessels that have steam as motive power. The existing law exempts naphtha and electric launches under 15 tons from inspection by the government. They are not required to have a licensed engineer, nor are they required to have a licensed pilot. There are thousands of these crafts, their principal use being for pleasure. There are so many accidents to vessels of this character, owing to their failure to display lights and to obey other rules, that the supervising inspectors have concluded to recommend to the secretary of the treasury that they be held to the same regulations requiring inspection and the carrying of a licensed pilot, etc., that apply to steam vessels. The recommendations of the board in this regard to the secretary of the treasury, or to the secretary of the new department of commerce and labor, will be transmitted to congress to be enacted into law. Here a storm of protest is expected from not only the owners and operators of vessels of this character but from the manufacturers as well. The opinion of the members of the board is, however, that such legislation would be wise and would be another safeguard around water traffic. The appalling accident at Toledo, last year, when seven persons of a party of thirty lost their lives in one of these pleasure crafts, on account of the ignorance of the operator, who displayed no lights although night had fallen, and thereby ran the boat into a tug, is only one of the many arguments advanced in support of the proposition to weave the law of safety around naphtha and electric launches.

There is a quiet war being waged between the boiler manufacturers and the board. The boiler men are pressing the secretary of the treasury for the appointment of a board irrespective of the board of supervising inspectors to consider the question of boilers and to make a report to congress of their findings. The boiler manufacturers desire to have a say as to the personnel of this board. Although knowing of the position taken by the boiler men, the supervising inspectors are going right ahead with a proposed revision of the boiler regulations. It is quite probable, therefore, that the boiler men will find fault with the conclusions of the board and may take their objections to congress at its coming session.

The work of the board is still far from completion. It will be well into July before the report will be ready for the hands of the secretary of the new department of commerce and labor. While the board up to July 1 had been under the control of the secretary of the treasury, it has now passed into the new department and George B. Cortelyou, late secretary to President McKinley, will be its executive head. The board has not as yet taken final action on any proposition. Most of the matters under discussion are in the several committees or being discussed in committee of the whole. The work is being conducted with the greatest secrecy. This is imperative for the present, owing to the trouble that would follow a leak of what is going on. If the board should state that they had determined on certain changes it would mean that immediately those opposed to the change would swarm to Washington and do what they could to head off the action of the board.

PLANS TO REORGANIZE NAVY DEPARTMENT.

Last week the navy department made public the details of the plan for the creation of a naval general staff recently suggested by the general board to Secretary Moody. The greatest interest is taken in the proposed organization in view of the fact that it will tend to completely reorganize the department. A chart has been prepared illustrating the general plan of the organization. The secretary is, of course, in control of the organization, and the assistant secretary during his absence. To the assistant secretary is assigned all subjects relating to the material of the navy and under him are placed all the bureaus of the department with the exception of the bureau of navigation, the duties of which are to be performed by the general staff corps. It is the plan to have the military end of the navy department placed under the senior ranking naval officer on duty at the department, who will have the position of chief of staff and who it is desired shall act as vice admiral. This officer will be responsible to the secretary for the organization and movements of the fleets and all subjects relating to the personnel of the naval service. Under the chief of staff there will be three grand divisions of the general staff, to be known as section 1, or the division of the fleet; section 2, the division of the personnel; and section 3, the division of war plans.

The chief of section 1 will rank as rear admiral, and during the absence of the chief of the general staff will have general supervision of the entire organization. This officer's duties will be the organization of fleets and squadrons, the arrangement for combined maneuvers, the mobilization and maneuvers of fleets and squadrons, the study of maneuvers of home and foreign fleets and to advise on all war plans and questions of policy involving foreign fleets.

Section 2, which it is proposed shall have control of the personnel of the navy, will be under the command of a rear admiral or senior captain. Under him will be an assistant chief of the section, who will look after the subdivision of the naval academy, the division of training men, the division of enlisted men and the division of officers. Each of these subdivisions will be in charge of an officer holding the rank of commander.

Section 3 will have charge of the preparation of war plans. Its chief will be a captain or a commander, whose duties will consist of the "study and development of all war plans, the organization of reserves, convoys and sea transports, interior and exterior transportation and to co-operate with the army general staff in plans of campaigns.

The war college section, which will rank on a par with section 3, will be under the command of a rear admiral, a captain or a commander, and will consist of ten or more commissioned officers, whose duty it will be to study and solve war plans, to study strategy and tactics, to prepare scientific and professional papers, and to prepare and conduct an annual course of instruction for junior officers of the navy. The naval intelligence board of inspection and promotion and retirement sections will rank with section 3 and the war college section, and will perform such duties as are indicated by their respective titles.

The scheme of the general staff contemplates the creation of an executive committee to consist of the chiefs of the general staff and sections 1, 2 and 3, the war college and intelligence sections. Its duties will be the formulation of war plans and the direction of the work of all the branches of the general staff.

It is proposed that the title of the general board be changed to the "general council," and shall consist of the admiral of the navy, the chiefs of the general staffs and sections 1, 2 and 3, the war college, intelligence and board of inspection sections, the commandant of the marine corps and such chiefs of bureaus and other officers of the navy as the secretary may designate The duties of this general council will be of an advisory nature on all subjects referred to it by the secretary, such as the naval policy of the United States, naval increase and plans, questions of a general nature affecting the government, administration and organization of the navy, and to be an advisory and amendatory power on war plans.

Many of the present bureau chiefs of the navy department are opposing the general staff ideas on the ground that it places too much power in the hands of a possible clique. Other officers of prominence, among whom may be mentioned Capt. Alfred T. Mahan, Admiral George Dewey, Rear Admiral H. C. Taylor, chief of the bureau of navigation, and Rear Admiral R. D. Evans are advocates of the proposition. It is understood that Secretary Moody has as yet refused to give his official indorsement to the plan or to promise to recommend its adoption to congress. Senator Eugene Hale and Representative Dayton of West Virginia, members of the senate and house naval affairs committees, respectively, are said to be strongly opposed to the plan

TO EXPERIMENT WITH WET COAL.

The manager of a Welsh colliery, having discovered that some coal which had been immersed for a number of years, gave better results than coal fresh from the pit's mouth when tested in competition, therewith reported his experience to the London Times. The British admiralty is now experimenting at Portsmouth. For the purpose of the trial a parcel of 21 tons has been taken from the coal stacks, with the knowledge that the coal came from the same pit's mouth, and was delivered at Portsmouth in one cargo, and has been since subjected to the same climatic exposure. Each lump of coal may, therefore, be presumed to have possessed identical qualities when the experiment commenced. The 21 tons were divided into eleven parcels. Five of the 2-ton parcels are now immersed in perforated cases in one of the basins; five other parcels of similar weight are placed under tarpaulins to protect the coal from climatic influences; and 1 ton has been burned in order to obtain scientific data as to its exact calorific properties. Nothing more will be done for twelve months. Then 2 tons of immersed coal will be burned in competition with 2 shore-stored tons, and the results will be compared with the log resulting from the observations taken at the burning of the ton already consumed. The other parcels will be burned from time to time, just as the officers who are carrying out the experiments may determine.

It will not now be necessary for the United States government to take forcible possession of the cruiser Galveston under construction at the Trigg ship yard in Richmond. A superior court has set aside the decision of the lower court which ordered an attachment upon the vessel in favor of creditors. A lot of rubbish was written in the newspapers about it, particularly about the concern of the navy department and of the imperative necessity of completing the Galveston forthwith for purposes of national defense. A score of Galvestons wouldn't make a mouthful for a battleship.

The report of the Bethlehem Steel Co. for the year ending April 30 comes as an interesting sidelight upon the affairs of the United States Ship Building Co. The manufacturing profits were $2,518,264; taxes, rentals and interest (the latter not including the $500,000 interest on the $10,000,000 Bethlehem Steel collateral trust 5 per cents, which the United States Ship Building Co. is to provide), $517,000; surplus, $2,000,714. According to these figures the net earnings were about four times the amount required for meeting the interest of $517,550 on the Bethlehem Iron 5 per cent. and Bethlehem Steel 6 per cent. mortgages.

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TROUBLES OF DOMINION IRON & STEEL CO.

A dispatch from Ottawa concerning the troubles of the Dominion Iron & Steel Co. says:

Last week the directors of the prosperous Nova Scotia Steel Co. and those of the embarrassed Dominion Iron & Steel Co. were in simultaneous session at Montreal. That an attempt to amalgamate the two concerns is going on appears the Canadian opinion. The alleged idea is that the management of both should be given to the practical men who have put the Pictou or Ferrona industry in first-rate shape. This arrangement would be a fine thing for the Sydney property, whose interests appear to have suffered by the stock market operations of men who seemed to think much more of booming shares than of making iron. By conservative methods the Pictou directors have won a fine position and general confidence. Their affairs financial have been largely confided to Messrs. John F. and G. W. Stairs, members of an old wealthy Halifax mercantile family, long distinguished for caution, probity and good sense. Mr. Fraser, their ironmaster, is also of excellent local connections, and has learned his business in the hard schools of experience and experiment. Of these men Mr. Kendall, Nova Scotian member of the Dominion parliament, said in the recent Ottawa discussion on iron and steel tariff: "The Nova Scotia steel business was taken up by good practical men, who worked first in a small way and developed their business, and all credit is due them, not only for the development of their own business, but for the establishment of the Dominion Iron & Steel Co. It was their knowledge, acquired under adverse conditions, which made those men trusted by investors in the iron business of this country." Some four or five years ago Messrs. Stairs and Fraser were frequently in Boston, negotiating with Mr. H. M. Whitney. Had they been given the reasonable terms and the control of the operations they then suggested it is improbable that any of the wildcat business which has harmed the Sydney concern would have been permitted. After Mr. Whitney had organized the industry it passed very much into the hands of Montreal and Toronto men, concerning whose methods statements that probably have not been yet published in Boston were recently made by responsible members on the floor of the Ottawa house of commons. Sir Wilfrid Laurier, the prime minister, than whom no man is more guarded in speech, found himself compelled to remark: "A great company which had been started with a great flourish, and which was supposed to be doing a good business has, I am sorry to say, been the object of a good deal of stock speculation, and has practically admitted it is not in a very good financial condition. It has come to us looking for an increase of the tariff." Mr. Fielding, the minister of finance, said: "Some of those who have approached us with reference to this particular company have stated that they do not complain that the result is in any way due to the policy of the government." Hon. I. Israel Tarte, recently minister of public works, declared that $100,000,000 "have changed hands during the last few months in connection with the Canadian iron and steel industry that was the subject of discussion." He wanted the government to favor it by more protection in order to boom the price of stock. Mr. Henri Bourassa, than whom there is no straighter man in Canadian public life, boldly exposed the methods of financing that had led to the alleged loss of the hundred millions. He said: "I am a protectionist, but I should be sorry to see this or any government use protection as a means of helping stock gamblers. Not that stock gambling is the only question involved here, but it is deeply involved. Under the present tariff, knowing exactly where they were, knowing what property they had, knowing what the population of Canada was, knowing the purchasing power of Canada, that company started some four or five years ago with a huge prospectus, asking the people to subscribe millions, and promising them large returns and profits without conveying the slightest hint that the tariff was an impediment. Therefore, I say, the prime minister is right in asking for some explanation regarding the management of the Dominion Iron & Steel Co. As regards the loss of $100,000,000, it is due to many people in the country losing their heads. If capital has become difficult, if bankers have become close-fisted, it is because capital was forced into improper channels. I know, as a matter of fact, that the managers and directors of the most important Canadian banks decided, last December, not that the tariff policy is wrong, but that an immense amount of capital was invested in stock gambling, and they decided to restrict supplies to stock gamblers. As to the Dominion Iron & Steel Co., its directors have repeated time and again that the ministry could not fail to be most prosperous, and if they were going to the government for more protection while enticing money from the people on the pretence that the company had a glowing future, I say a thorough investigation should be held, and if the people have been robbed by the directors of the Dominion Iron & Steel Co., these directors should be held accountable before that industry is given more protection."

"What," Mr. Bourassa asked, "was the prime occupation of this company? They issued bonds to the extent of $8,000,000 at the rate of $85 for every bond of $100, and every purchaser of a bond received in addition a paid-up share of $100 of common stock. So that the company gave a par value in bonds and shares of $200 for $85. They issued preferred stock to the amount of $5,000,000; they issued common stock to the amount of $20,000,000; they gave shares all over the country, and they made returns of the common shares to the amount of 80 per cent., because it was such a tremendous industry, and the best investment the people of Canada could make. And during all this time, I am told by an ex-minister, they were going to the government and begging for more protection because otherwise they could not live. Let me add, as a piece of information that has been current on the streets of Montreal for some weeks, that a high official of the Dominion Iron & Steel Co. has placed on the market one thousand shares of his own company's securities. Perhaps that has had something to do with the fall in the value of the shares. If we wish to bring in foreign capital to support our industries, if we wish British, American and German capitalists to invest in Canada, we must make it known that no board of directors is allowed to speak one way in secret to get favors from the government, and another way to the public when they want to get its money. The government's hands should be strong enough to force those who made these promises to give an account of their deeds."

TREND OF ATLANTIC TRADE.

The Liverpool Journal of Commerce, which is probably the foremost daily newspaper in the world devoted to shipping matters, says of the late trend of events in the Atlantic trade:

"Since the formation of what is so familiarly known as the Atlantic combine Americans and Britons alike have been more interested in the trade combined under the guiding influence of that master of finance, Mr. Pierpont Morgan, than has been the case during the past thirty-five years. Many have been not a little nonplussed by the characteristic steadiness with which the Atlantic services have been maintained, the real effects of the amalgamation comprising the International Mercantile Marine Co. being practically confined to the concerns interested, and casually to the very keenest observers. Apparently everything has progressed as before with the exception of alterations of sailings, and a disposition of the ships of the fleets combined such as would not have taken place under the conditions ruling before the grand coup. Such, then, are the only changes which seemingly have followed the creation of the great combination, but as a matter of fact it is not so. Indeed, it is now stated—if not officially, yet we have it on very reliable authority—that the Cunard Steamship Co. has notified its intention to withdraw from the Atlantic conference. This places the company in the unique position of contending against practically the whole of the combined Atlantic fleets, and the result will be watched with considerable interest. By assuming this responsibility the Cunard company is exercising a prerogative which many thought some time since would be undertaken by the International Mercantile Marine Co. In taking this step the directors have no doubt reviewed the situation, and have so acted, in their opinion, through force of circumstances. A careful survey of the condition of the Atlantic trade will reveal the fact that the tonnage now engaged in the traffic is in excess of requirements. It may be true that a few of the boats are full of passengers, but as one swallow does not make a summer, it may also be argued that two or three full ships do not indicate the healthiest state of the transatlantic passenger traffic, and do not warrant any departure from the pre-existing sailings. What effect this action will have upon the Atlantic trade it is difficult to prognosticate, but those best able to judge do not appear to anticipate any material change. As will be remembered, the policy of the combined lines was declared as friendly, and that principle has been followed apparently from the first. It is therefore unlikely that antagonistic measures will now be adopted by the Morgan interest. That being the case, it is scarcely likely that the Cunard company will carry war into the camp of so powerful an opponent, although it may be considered by the company advisable to secure that liberty of action which can alone be obtained by a severance of all restrictive ties."

MR. PIERPONT MORGAN RETURNS.

Mr. J. Pierpont Morgan returned from England on the Oceanic last week and he was in the same humor with which the public invariably associates him—surly, irritable, brusque and gruff. Twenty photographers climbed aboard the steamship at quarantine and leveled their cameras in his direction. It would be incorrect to say that they leveled them at him, for he occupied himself incessantly with dodging them and no one got him into focus. He finally tired of being pursued, however, and appealed to the officers of the ship for protection. The purser thereupon delivered a sweeping edict and said that unless they desisted Mr. Morgan would forever forbid a photographer setting foot on any of the vessels of the International Mercantile Marine Co. The photographers thereupon turned their attention to Sir Thomas Lipton, who was also on board, and he obligingly posed for them in a variety of attitudes. Mr. Morgan declined to talk of the shipping combine or the Steel Corporation, but was quite loquacious on the subject of the Houdin busts which he recently purchased, saying that he had left them in his London house when he discovered that the United States government had determined to levy a duty upon them. At the office of J. P. Morgan & Co. it was emphatically denied that the shipping combination was to be reorganized or that Charles M. Schwab was to resign as president of the Steel Corporation. The latter rumor has been circulated persistently in Wall street.

Mr. W. L. Brown, president of the American Ship Building Co., in an interview given out in Chicago, says that he is confident that ship building will continue to be an increasingly important industry on the great lakes. Wooden boats are wearing out and going to pieces, he says, and the territory fed by the lakes is rapidly increasing. The modern steel carrier must continue to supplant the poorer class.

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FROM THE HEAD OF THE LAKES.

Duluth, Minn., July 1.—Stocks of grain now aggregate 4,780,000 bu., of which nearly 3,000,000 bu. are flax, 1,571,000 bu. wheat and the rest other grains. Receipts have been surprisingly good the past week, in wheat, flax and oats, and the total of the year is figuring heavier than was anticipated. In flax alone there has been received on the crop year 18,600,000 bu. more than the entire crop of the United States a few years ago. Oats are coming in very fast just now, chiefly to one firm, and the increase of stock for the week has been 124,000 bu. Flour, on the other hand, is coming in very lightly and there is no appreciable indication of an improvement in its condition. Line boats feel the loss severely, though the general package freight trade, especially west bound, is far ahead of any preceding year, and is becoming a very large matter. Line managers have announced a wheat rate to Buffalo of 1⅜ cents a bushel, with the further announcement that until the fall business begins ⅛ cent will be added to the freight rate every fifteen days. This looks as though they think they will be able to control the wheat rate, but of course the shippers say this is an absolute impossibility.

About 1,200 men are in the employ of the Superior Ship Building Co. and work now under way will cause this number to be retained all summer. The steamer for H. A. Hawgood and associates will be built here and is to be laid down at once. Six large new steel ships have been under construction at this yard within the present year; this in addition to the very large amount of repair and outfitting work that is now taking place and which is very much heavier during the winter and spring. Repair work at this yard is growing very fast and will be of more and more relative importance. Two ships have been launched, two were to have been on last Saturday, but are delayed a while, a fifth is in frame, and the sixth will be laid down in about two weeks. Mr. J. C. Wallace, general manager of the combination, was at the Superior yards the past week, on his way home from the coast.

Measurements of the foundation of the Peavey concrete elevator give the rather surprising information that the foundation in the corner where the late collapses occurred is settled 3½ in. It seems that there was an old government channel just about where that side of the house is, and that the filling, made long before there was thought of the erection of this great elevator, was of any old material. Of course it is no wonder that the end of the house went out, and it is only surprising that more of it has not gone under such circumstances. The company will at once strengthen the foundations and rebuild the broken part, using the same material and following the same form of construction that prevails in the major portion of the structure.

With the advent of the Wisconsin & Michigan Railway on the Menominee range, next spring, there will be three competitors for ore traffic from Crystal Falls and other parts of the region. All three roads will have docks at the same point, for the W. & M. is to erect large dockage the coming winter. The new road is now under way, grading contractors having started on a large part of the improvement. Up to two years ago the Northwestern was the single road to the district, and its revenue from ore was very large. There has been no decrease in the rate since then, but the hustle for traffic is quite sharp between the Northwestern and the Milwaukee. It is an interesting fact in this connection that the Milwaukee was one of the early ore roads of that range, and in panic years tore up its tracks and laid them elsewhere.

Traffic along the north shore of Lake Superior, and head of the lakes excursion business out of Duluth-Superior, is better this year than in any past season. The Isle Royal business is very good this year and bids fair to become a really important branch of the Lake Superior passenger trade. There is room in these trades for a different class of boats than are employed, and there is some talk of new excursion steamers.

Longshoremen at the head of the lakes, who have been on strike since the opening of navigation for higher pay for flour loading at Duluth, have been enjoined by Judge Lochren, in the United States court, from interfering with the flour contractors and their men, or from in any way attempting to stop the handling of merchandise over the docks. There has been much trouble between contractors Knutson & Eden and the strikers ever since the strike began.

The Drake & Stratton Co., large mine stripping contractors, are to erect at Hibbing, Minn., a machine shop covering about 5,500 sq. ft. of ground. It will be equipped for repairing steam shovels and other machinery.

The lumber steamer Thomas D. Stimson was burned and scuttled at St. Clair Flats on Tuesday. The crew had difficulty in escaping so quickly did the flames spread. The vessel was owned by Capt A. B. Slyfield.

DEFENDING THE HYDROGRAPHIC OFFICES.

Editor Marine Review:—A representative of the treasury department is making the rounds of lake ports that have hydrographic offices and United States engineer offices. He is investigating the necessity of retaining naval officers in charge of the branch hydrographic offices and also inquiring particularly in regard to the usefulness of the hydrographic office charts and engineer charts covering the same waters, one being polyconic and the other on the Mercator projection. He so frames his inquiries as to induce answers in favor of the engineer charts if possible It will be remembered that Mr. Moody and Congressman Cannon led the fight on appropriations for the hydrographic offices two years ago when the coast and geodetic survey tried to oust the navy from doing any survey work, but were defeated. Mr. Moody, now secretary of the navy, several weeks ago issued an order, or memorandum, that if carried out would withdraw all naval officers from all hydrographic offices except two, New York and San Francisco. Then he left Washington to avoid the disturbance he knew this order would create. When he returned he found his desk loaded with letters of protests against this order and has acknowledged a number of them without saying that he would or would not retain the officers at the hydrographic offices. A representative of the department has now been authorized by the secretary to make a personal investigation of this matter, and he is traveling quietly and fast enough to prevent advance news of his coming reaching those interested He has been in Buffalo, Cleveland, Detroit, Chicago and Duluth. In Chicago he saw Geo. B. Carpenter, Rand, McNally & Co., Congressman Foss, the hydrographic office and several vessel captains It would appear from the trend of his inquiries and the manner in which his questions were phrased that the secretary is trying to get a report which will give him some color of evidence to support his announced intention of removing the naval officers from these positions and of ceasing chart work on the lakes.

In other words, the fight of two years ago is to be revived with the chief opponent of the offices nominally in charge of them. It will be remembered that when the fight was on in congress the motives of the opponents of the hydrographic offices were shown to be that a number of political places might be provided in the coast and geodetic survey, while it was impossible to do so where the navy was in charge. This and the well-known jealousy of the engineers led the two to combine forces to oust the navy from this work. It will also be remembered that Congressman Cannon stated on the floor of the house that naval officers were unfit to do the work and that the navy showed that it had loaned officers to the coast and geodetic survey to do the work for the latter body. Out of 122 surveys made by the coast and geodetic survey 114 were made by naval officers loaned for that purpose. It was the only fight the engineers and coast and geodetic survey had ever lost, and they have felt very sore over it ever since. Now they are about to resume it as stated, with their chief partisan at the head of the navy.

It is true that lake men have been rather slow to appreciate the work of the branch hydrographic offices for the reason that the captains thought at first that the navy was going to trench upon their prerogatives. I have been told this by a captain who is now a warm supporter of these offices; but one by one they have been induced to consider the subject fairly, and those who understand the work from frequent communication with the officers and nautical experts in charge of the offices, all agree that it would be detrimental to the interests of insurance companies, shippers, brokers, boards of trade, owners and captains to have these offices removed or their efficiency impaired.

As to the hydrographic office charts, the Malietoa shoal was found at a cost of $30,000 to the owners of the vessel for which it is named, at a spot where the engineer chart of latest date showed plenty of water, while the hydrographic office chart of the previous February showed the shoal with the depth of water on it plainly marked. All the vessels of the line to which the Malietoa belongs now carry both engineer and hydrographic office charts Other instances might be given. Those who have studied navigation know also the effect of laying down a course in straight lines on a chart of polyconic projection Several who did not know it discovered Pelee point in thick weather. All the engineer charts are polyconic and the courses on them are straight lines. The hydrographic offices have all rendered great service to the maritime interests of the lakes by disseminating information about the compass, magnetic ranges, variation and deviation from causes not connected with the ship, particularly on Lake Superior. No price is too great to pay for increased safety to the vessel interests, particularly when owners will insist on loading within 6 in. of the bottom, as every one knows they do, and it behooves the vessel interests to be up and doing if they wish to retain unimpaired the efficiency of the hydrographic offices.

Chicago, June 23, 1903. JOHN SAXE.

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AROUND THE GREAT LAKES.

Buffalo shipped 289,663 tons of hard coal by lake during June.

While the Canadian steamer Eureka was coaling at Sorel, Ont., she listed so badly that her open port holes went under. The vessel sank and the crew jumped.

The big whaleback excursion steamer Christopher Columbus made her first trip of the season out of the Chicago river on Saturday last. She will run, as usual, between Chicago and Milwaukee.

Stewart H. Moore, formerly United States inspector of marine boilers in Chicago, has been appointed Chicago representative of the Iowa boiler. It is a water-tube boiler and Mr. Moore is introducing it to marine men.

Lighthouse board officials announce that the light on the southwesterly side of the entrance to Sturgeon Bay canal from the harbor of refuge, which was temporarily discontinued June 8, will be permanently discontinued on or about July 1.

A cargo of 7,510 gross tons of ore was taken into Lorain recently by the Steel Corporation steamer John W. Gates, one of the "big four." The Gates encountered no difficulty in going up to the Lorain Steel Co.'s docks, four miles from the mouth of the harbor.

Capt. Glover of Conneaut has received a letter from the secretary of the treasury stating that he has been awarded a medal in recognition of his heroic efforts in saving the crew of the schooner Nellie Mason in a fierce storm off Port Colborne in October, 1895.

The Erie Stewart, a schooner owned by Peggot & Sons, was towed into Owen Sound last week in a waterlogged condition. Her cargo of lumber prevented her from sinking. She was towed into port by the tug Hanson after her condition had been reported by the steamer Atlantic.

Congressman George E. Foss of Chicago visited Waukegan on a tug last week and inspected the harbor. He was accompanied by government engineers and by officials of the Chicago & Great Lakes Dredge & Dock Co. The government is spending $350,000 on Waukegan harbor.

It is reported from Duluth that the steamers A. B. Wolvin and William F. Palmer of the Steel Corporation are to become a part of the fleet of the Great Lakes & St. Lawrence River Transportation Co. and enter the grain trade between Chicago and Duluth on the lakes and Quebec and on the St. Lawrence river.

The Hyacinth, United States engineer boat for the lighthouse service, is now at Milwaukee being fitted out. As soon as finished she will be turned over to Maj. J. G. Warren. She is 16 ft. long, 28 ft. beam and 14 ft. deep. The Hyacinth was built at the Jenks ship yard, Port Huron, and is modern in every respect.

Senator Russel A. Alger has recommended to President Roosevelt that Mr. George Y. Wisner be appointed as the civil engineer member of the international commission to consider the level of the lakes and other matters. There are indications that the president intends shortly to announce the personnel of this commission.

In order to guard its ore docks from fire the Great Northern railway has chartered the tug Buffalo of the Great Lakes Towing Co.'s fleet and has stationed it in Allouez bay. The tug will do towing, but will always be within reach of the docks. She is fitted with modern fire-fighting apparatus and can throw five streams of water.

W. F. Carrol of 1011-1012 Ashland block, Chicago, who now owns the steamer Gordon Campbell, says he is inclined to think that at some time in the past the credit of the vessel has been hurt by delays in settling claims against her for supplies, etc., but that there need be no fear as to the payment of bills incurred against her while he owns her.

So pleased are officials of Dunkley-Williams company with their new possession, the steamer City of South Haven, built by the Craig Ship Building Co., Toledo, that they are willing to match her against anything on Lake Michigan—at least so says W. K. Greenbaum, general freight agent. The South Haven is designed to maintain a schedule of 20 miles an hour.

Capt. Abram Ellsworth, one of the oldest captains on the lakes, died at his home in Cleveland Tuesday of this week. He was seventy-seven years of age and had lived in Cleveland since 1852. He was born at St. Johns, New Brunswick, and from that point he started his career as a sailor. He had sailed around the world many times and the lakes for a great many years.

Fears are entertained for the safety of O. E. Heffelbower, assistant engineer in charge of the United States survey operations at Sault Ste. Marie. He started from Detour in a small skiff and has not been found since. The skiff went ashore on St. Joseph's island. The settlers on the island said that they saw a man fall out of it when two miles from the shore. The government tug Antelope will drag the locality for the body.

J. M. Longyear, whose interests in iron ore mines are very extensive, is moving his residence from Marquette to Brookline, Mass. This is true literally—he is moving stone for stone the beautiful residence which he erected in Marquette half a dozen years ago and refashioning it at Brookline. The cost, of course, is vastly in excess of what it would be to build a duplicate structure in Brookline—and the original structure cost over $500,000.

No insurance was carried by the Great Lakes Towing Co. on the tug Cheney, which was run down and sunk by the steamer Chemung off Buffalo harbor recently in a fog. The tug was worth about $7,000. The men who were saved after the collision can give little information as to the location of the sunken vessel and she will probably never be found. From such information as can be had from those rescued it would seem that fault can not be attributed to the Chemung.

D. W. Porter, of Benton Harbor, Mich., launched in the St. Joseph river, a few days ago, an odd looking craft 18 ft. long and 3 ft. 6 in. beam. The hull consists of two galvanized tin cylinders conical at each end. These are 2 ft. apart and upon them rests the deck, which is 16 ft. in length. Around the upper structure is a railing, and seats are arranged conveniently. Each cylinder is divided into eighteen watertight compartments and is therefore said to be practically unsinkable.

A spectacle, at least unusual, was witnessed at the launching of the steamer Wilbert L. Smith at the Lorain works of the American Ship Building Co. this week. The principals and chorus of an opera company, singing at the Gardens in Cleveland, gave some operatic selections as the steamer took her initial dip. The Smith is one of several large freighters that have been under construction during several months past for the United States Transportation Co. of Cleveland. Her dimensions are: Length, 400 ft.; beam, 50 ft.; depth, 28 ft.

Notwithstanding the fact that the advertisement for the construction of two twin-screw suction dredges, published by Major Sanford of Philadelphia, specifically states that the dredges are for service in New York harbor, the lake newspapers insist that one of them is for service in Cleveland. The government dredge for Cleveland harbor has not yet been designed. Apparently the government, through its army engineers, intends to go into the dredging business. This encroachment upon private right should be persistently fought in and out of congress.

The stranding of the steamer John Craig on Simmons' reef will certainly result in a heavy loss to underwriters and possibly the loss of the vessel. Almost all the steamer's cargo of 95,000 bu. of corn had to be thrown overboard. The steamer herself is badly twisted on the rocks. It was hoped at last accounts that with good weather she could be saved by building a cofferdam around her. Her cargo was consigned by the Armour Grain Co. to the Grand Trunk Railway at Meaford, Ont. Owners of the vessel, one of the Gilchrist companies, have $65,000 insurance on her.

It was of course understood that an error was made last week in the line that appeared under a picture of a tow of lumber carriers, and which read "the A. W. Comstock and tow." The vessels are owned largely by A. W. Comstock and might well be spoken of as "the A. W. Comstock tow," but the steamer was the Simon Langell with the barges W. K. Moore, Interlaken and Arenac. The picture was taken just after the vessels had received extensive repairs at the works of Abram Smith & Son, Algonac, Mich., where repairs to wooden vessels on a large scale are going on all the time, but more especially during winters.

United States engineer officers in charge of the lake survey and the publication of charts are certainly more active this summer than ever before in the work of surveying shoal places, locating and marking wrecks, etc. The quarrel between army and navy officers regarding this work is resulting in benefits to the shipping interests. The lake survey steamer Williams left Detroit a few days ago to take up the work of sweeping the entire western end of Lake Erie. It is thought there are many obstructions between the islands and the western end of the lake which have not been located and which are not on the charts.

The passenger steamer City of South Haven, just completed at the works of the Craigs, Toledo, for service between Chicago and South Haven, Mich., is not only a fast vessel, but is also elegant of interior. Much of the interior finish of this vessel is an African mahogany known as Benin wood. It is of a beautiful dark color, highly figured, and comes from the west coast of Africa. It has been used in the United States only in recent years and is new to the lakes. It was furnished to the Craigs by the Martin-Barriss Co. of Cleveland, who have for years sold large quantities of hard woods for cabin finish to ship builders, much of it of the very finest kind.

Three more of the ten steamers known as Wolvin canalers, which the American Ship Building Co. contracted last fall to build for the Great Lakes & St. Lawrence River Transportation Co., are up to the launching stage and will be going into commission within a few weeks. Two of them, the John Crerar and Albert M. Marshall, were launched on Saturday last, the former at South Chicago and the latter at Wyandotte. The third, to be named H. G. Dalton, was to have been launched at the same time at the West Superior works, but this launch was delayed, as was also the launch at the same works of a much larger steamer, the D. M. Clemson, for the Provident Steamship Co., of which Mr. A. B. Wolvin is also general manager.

Two modern steel steamers, the Steinbrenner and Minch, owned by Cleveland families for which the vessels have been named, passed up at Detroit within 10 minutes of each other on Wednesday of last week. Both were light and both were going to the head of Lake Superior for ore, the Steinbrenner to Superior and the Minch to Duluth. They were loaded without delay in either case and again passed Detroit on Monday last within a few lengths of each other, this time bound down. On the up trip the Steinbrenner was 10 minutes ahead of the Minch at Detroit and in passing down the difference was 15 minutes in the Steinbrenner's favor. Of course at some points on the run to and from the head of the lakes the difference in time between the two vessels was greater than that noted at Detroit.

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LAKE SUPERIOR IRON CO.

Its Semi-Centennial is Celebrated at Ishpeming—Addresses Dealing with the Development of the Iron Mining Industry and Recalling the Struggles of Early Days in the Upper Michigan Peninsula.

Last week the Lake Superior Iron Co. (now a part of the United States Steel Corporation) celebrated its semi-centennial at Ishpeming, Mich. For three days mining was not pursued, sports and games of all kinds taking the place of business. Sums of money were distributed among the older of the workmen, prizes were awarded to the victors in athletic contests and the festivities were crowned with a barbecue in which everyone partook. Mr. James Gayley, vice-president of the Steel Corporation, was the presiding officer. Mr. Gayley delivered a short address, picturing graphically the growth of the iron and steel industry from small beginnings in the Lake Superior region to its present enormous development. The semi-centennial measures half a century of marvelous development in all lines of human endeavor. It is difficult to picture what has happened in the last fifty years in the iron industry. A half century ago the United States produced only one-sixth as much iron ore as Great Britain. Last year the ore mined in this country was more than double that produced in Britain. Sixty years ago 60 lbs. of iron was the per capita consumption; now it is 500 lbs. Mr. Gayley said there had been another transformation in the past fifty years in corporate organization. He rapidly sketched the history of business enterprises from the single individual owner to the partnership, followed by the company and finally the great corporation in which common interests are unified in one great consolidation. The crowning achievement of this tendency towards consolidation was the organization of the Steel Corporation two years ago. It was the greatest product of the industrial age. The man who was responsible for its inception possessed as much imagination as Shakespeare or Dante. This great corporation stands for all that is best in industrial enterprise. In it are to be found all the elements of strength and stability.

In introducing the Hon. Peter White Mr. Gayley paid a fine tribute to the work of the early pioneers who settled in the upper peninsula and who were concerned in the founding of the mining business. They were intelligent in action and indomitable in purpose.

The Lake Superior Iron Co. was the third of the iron companies to be established in the peninsula. The Jackson Iron Co. was the first, the Cleveland Iron Mining Co. was second, and the Lake Superior came next. P. M. Everett was the leading figure in forming the original Jackson Iron Co., though, like all the members of this original company, he did not profit from it. In fact, in digging into the history of this region, Mr. Everett is shortly to be found mining ore at 50 cents a ton for other people from the mine which he was instrumental in discovering. The Cleveland mine was located in 1846 by Dr. J. Lang Cassells of Cleveland in behalf of a number of Cleveland gentlemen who had sent him into the peninsula. The Lake Superior mine was preempted by Isaiah Briggs, a packer of provisions, who had established a half-way station for himself and his pony on the location when he was engaged in the business of furnishing supplies to the surveyors who were running the township lines. Briggs entered the claim on behalf of John Burt and it was allowed by the government. Burt gave an undivided one-half interest in it to Robert Graveraet, and Graveraet in turn assigned this one-half interest to the Marquette Iron Co. The Marquette Iron Co. later transferred it with the rest of its assets to the Cleveland Iron Mining Co., who sold it to the Lake Superior Iron Co., and thus made that company's possession of the entire location complete. This in brief is the beginning of the Lake Superior Iron Co., though there were innumerable interesting side adventures in the completion of its title. Articles of association for the Lake Superior Iron Co. were filed in March, 1853, and the incorporators were as follows: Heman B. Ely and Anson Gorton, Marquette; Samuel P. Ely, George H. Ely and Alvan Strong, Rochester, N. Y. In July, 1857, Capt. Gilbert D. Johnson, first mining superintendent of the company, took charge under the management of H. B. Ely, general agent. Four workmen assisted him. The wages were 75 cents a day for common labor. The first cargo, eight cars, was sent out by rail on Oct. 10, 1857.

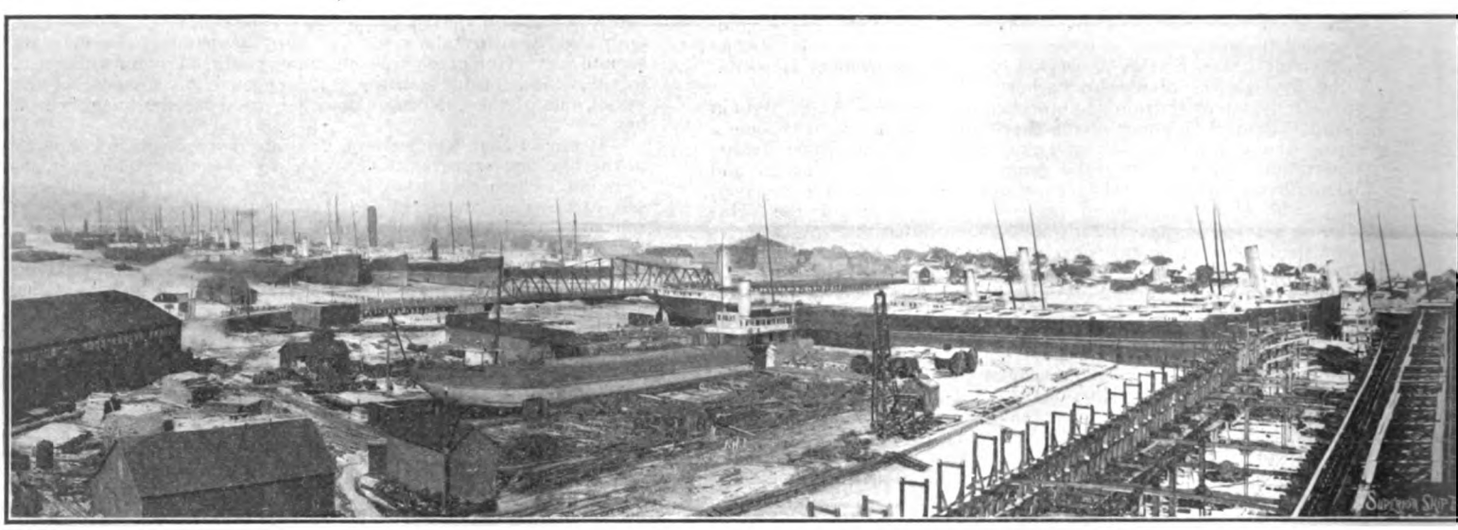
ADDRESS OF THE HON. PETER WHITE.

The chief address of the semi-centennial was made by the Hon. Peter White of Marquette, Mich.

"When I came here in 1849," said Mr. White, "there were only three men in all the territory that now constitutes Ishpeming. Their names were Capt. Samuel Moody, John H. Mann and Edmund Carthy Rogers. The first was killed at the battle of Franklin, Tenn.; the second was drowned on Lake Superior in 1851, and the third became a celebrated physician in Chicago. He died only a few years ago at Rome. He was a brother of Randolph Rogers, the great American sculptor. When the town was to be given a legal organization I had the honor and pleasure of giving Ishpeming its name. It is a Chippewa word meaning 'on high' or 'the highest.' There is no other way to say heaven in the Chippewa language. It also means the highest place between two given points—thus Lake Michigan on one side and Lake Superior on the other. Ishpeming is the highest point—the dividing line. You have the Carp river running into Lake Superior and the Escanaba river running into Lake Michigan.

"Hon. Heman B. Ely and Mr. John Burt were the prime movers in the organization, exploration and development of this company. I presume and almost know that Mr. Heman B. Ely was induced to come here and take the interest he did by Mr. John Burt, who already had acquired large interests in this county. They came together, although Mr. Burt had been here many times several years previous. Mr. Burt was a son of the celebrated William Austin Burt, famous for his invention of the solar compass and also the first typewriter in the world. Mr. John Burt was from Macomb county, Michigan, and was a very active, far seeing and intelligent man. He was a large stockholder and many years a director of this company.

"Up to 1853 there was no general mining law in Michigan. All companies organized before that had special charters granted direct to each company by the legislature. The new constitution of 1850 had just been adopted and ratified by a vote of the people, which forbade the legislature granting any charters except municipal, but provided that the legislature might pass a general mining law. It was so important for this part of the state to have an able man to represent us in the legislature of 1853 that we made sure to elect Hon. Heman B. Ely as our representative for the then coming session. He accomplished for us all that was good in the general mining law of 1853. The sessions of the legislature were then limited to forty days, and Mr. Ely told me that he had never worked so hard in his life. The farmers in that legislature wanted a general mining law that would have been worse than nothing. We owe a great deal to Mr. Ely for his work for us at that time. Mr. Ely came from Rochester, N. Y., and joined with others in the development of this and allied interests. He was a man of education, great practical and scientific knowledge, with a wide experience. He had been admitted to the bar of the courts of New York, Ohio and Michigan, but had abandoned law practice and taken up railway and telegraph construction. I believe his last previous venture had been the construction of a telegraph line westward from Buffalo to Cleveland and westward from there, but the country was not yet ripe for such extensive telegraph lines and he lost a large



Panorama Photograph of the Yard of the Superior Ship

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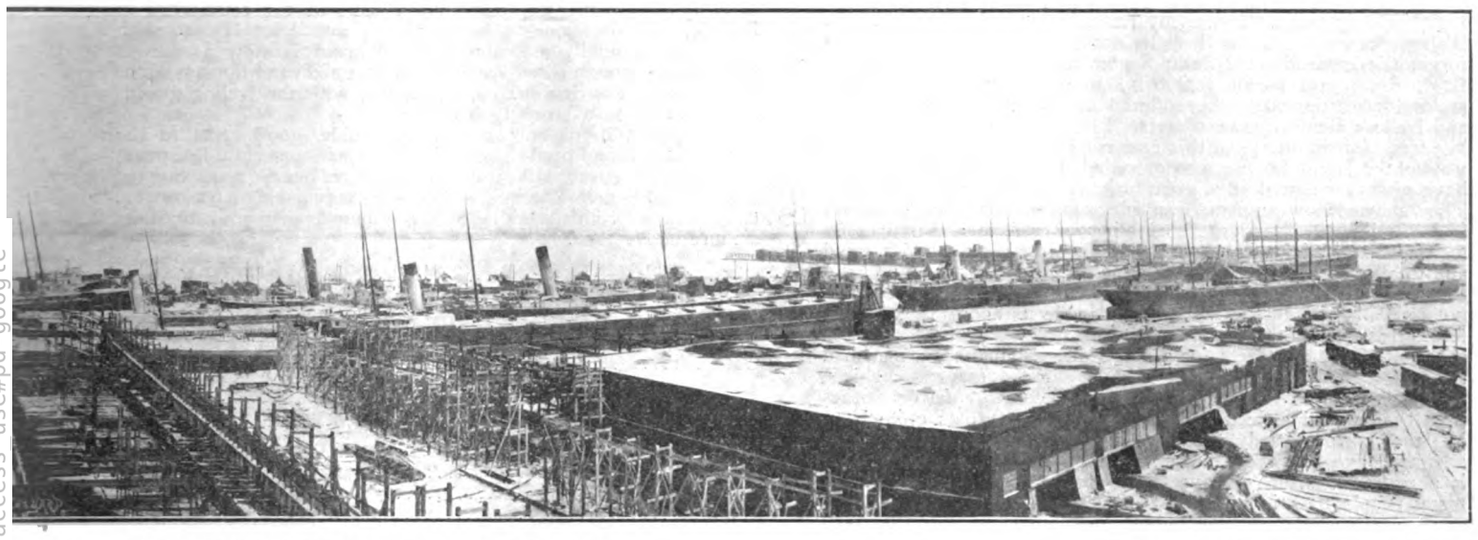
amount of capital on the scheme. His coming to Lake Superior was an effort to retrieve his fortunes, and in this he was heavily backed by his brothers in Rochester and their friends. Coming here he began the first railroad, the one to the so-called iron mountains, and his influence in the community was at once conspicuous. He was a prime mover in everything which called for public spirit. We were indebted to him for our first public celebration of the Fourth of July and the opening of the completed ship-canal at Sault Ste. Marie. He died before he had been here very long, but his death brought us as a natural result the coming of his brother, Mr. Samuel P. Ely, a man in just as many respects remarkable.

"Mr. S. P. Ely was general manager of the Lake Superior Iron Co. from 1858 to 1873 when his interest in the newly discovered iron range in Minnesota became important enough to draw him away from us. He brought capital enough here to develop both the railway and the mines. This he secured very largely through influence of his family connection with Mr. Joseph Story Fay of Boston. It would be difficult to imagine Marquette county through more than thirty years without Mr. Ely. He was highly educated, cultured and refined. He helped to stamp almost every town in this county with the marks they bear today. He must have loved the country and its people, for dying in a foreign land, not very long ago, his body was brought back here at his dying request, to be laid among us for its last rest. Almost every man or woman in any way connected with the Lake Superior Iron Co. gave up the day to attend his funeral. His active and practical man at this company's mines was Capt. Gilbert D. Johnson.

"Capt. Johnson was an able, experienced mining man. He came here from Jackson, Mich. Mr. Joseph S. Fay of Boston, who was interested through Mr. Ely in this company and was its president for many years, was no stranger to the people of this



ing Co., taken just before the Break-up in the Spring. [*Photo by Crandall & Fletcher, Duluth.*

county. He was a lovable man, sympathetic and liberal. He always came once a year to see us and often twice. It was the Fay interest which was secured as the basis of the United States Steel Corporation's control, and in which the Cleveland Cliffs Iron Co. also became interested. The Lake Superior Iron Co. has developed its mines along the same lines as its sister companies, branching out in the control of allied interests like railroads and shipping. This company was one of the earliest in the issue of what was known as iron money, every dollar of which was honestly redeemed.

EARLY MINING PRIMEVAL INDEED.

"Before this city had a name, and this company any existence, these rocky prominences around us were known as the iron mountains of Lake Superior, and it was to them I came, under the leadership of Robert J. Graveraet, a masterful, energetic and pioneer spirit, in the spring of 1849. I came into Ishpeming first with a pack on my back weighing 40 lbs. My party marched from the shore as far as this between early morning and two in the afternoon, over an apology for a road. I hadn't packed before and was tired out pretty early; but after a cup of tea and some refreshing food I was able to resume the pack of which Graveraet had relieved me without relinquishing his own. At that time there were but two houses, both built of logs, where Ishpeming now stands. There are a great many here now who can hardly appreciate the look of things then, for the whole country was covered with almost impenetrable forest. There was a great deal more water, and infinitely more swamp, and as for flies, they were innumerable, and worse than the tortures of the inquisition. There were all sorts of flies, mosquitoes, sand flies, deer flies, midgets, moose flies, dog flies and their remotest cousins. The clearing and drainage of the country has driven them all from the settled towns, but here they had full squatters' rights. Life as it was then for the pioneer will soon be almost an impossibility, but there is yet part of our territory where you may still find a fair imitation of it, and fancy yourself living under the conditions of fifty years ago. There has been hardly more change in the appearance of things above ground, in the erection of this populous city where the forest once reigned, than in matters below ground. At first we did not used to do underground mining, nor did we think of ore deposits beneath swamps and low lying valleys.

"We attacked the rough iron mountains with our picks and sledges. We had no drills or powder. Jack Frost had thrown down thousands of tons of broken rock, much of it ore of the finest quality. There was at first no thought of shipping ore. It was all made into charcoal blooms by very laborious processes, often at far greater cost than it could be sold for, sometimes three times as great. It is now almost difficult to understand how we staid here and why. But there were forces behind us pressing us on. Fresh arrivals came in. The American people have never been easily discouraged, and years of patient preparation always precede great discoveries and great commercial successes. Besides we were all young men, fond of adventure, fond of freedom, of wild life and new openings. Some went away, but it is almost universally true that nearly all came back again. While life here was always expensive, yet from the very first a man could garden profitably and with no tool but a grub hoe, and fish and game were easily to be had to relieve the monotony of salt provisions. I still recall my first meal at Marquette fifty-four years ago in the hospitable wigwam of Kaw-baw-gam, with the greatest of pleasure. We were a homogeneous little body in those days. There were of course the aborigines and a very few French, but the first comers were of pure American stock, mostly eastern men. Save for pioneers from Macomb and Jackson counties, the lower peninsula has never seemed to take much interest in getting anything out of this country but taxes. I mean the iron country. They found our pine, but the iron and copper they left to Boston and the Western Reserve. There has always been a curious conservatism in the business men of Detroit, which made them allow Cleveland and Buffalo, Chicago and Milwaukee to develop at their expense, and even now they are just finding us out and wondering where the great iron fortunes came from.

"Citizens of Ishpeming are now a polyglot class. The first practical miners were all Cornish, though some of the early captains were Americans. Any miner but a Cornishman was at first unknown. They were practical and very daring men. Work underground will always have its peculiar dangers, but mines are now immensely safer than they were. New appliances for effectiveness and safety are being added daily. But the days of the dangling rope and rickety ladder were the days of the Cornishman's glory. For the last twenty years all the countries of Europe where mining has ever been carried on have sent us a contingent, so that fully 55 per cent. of the population of our mining towns is now registered as of foreign birth. But they are being assimilated with astonishing rapidity by means of our political institutions and our public schools. It took Lake Superior iron a long time to achieve its now overwhelming importance in the world market. The steps were many and various. The first necessary step was the ship-canal at the Sault, the next was the railroad, the next was the enlarging of the size of the ore carriers, the next was the Bessemer steel process, the next was scientific mixture of ores, and the last has been consolidation of interests.

EARLY DAYS CONTRASTED WITH THE PRESENT.

"Dwellers in Ishpeming have been eating this spring fresh California oranges, Alabama strawberries, Baltimore oysters, Connecticut river shad. We got along without them for many years. What we had was in season, and the seasons all came at once. My auditors now have all read last evening's Chicago papers this morning, put aboard the express at 10:30 last night. We got

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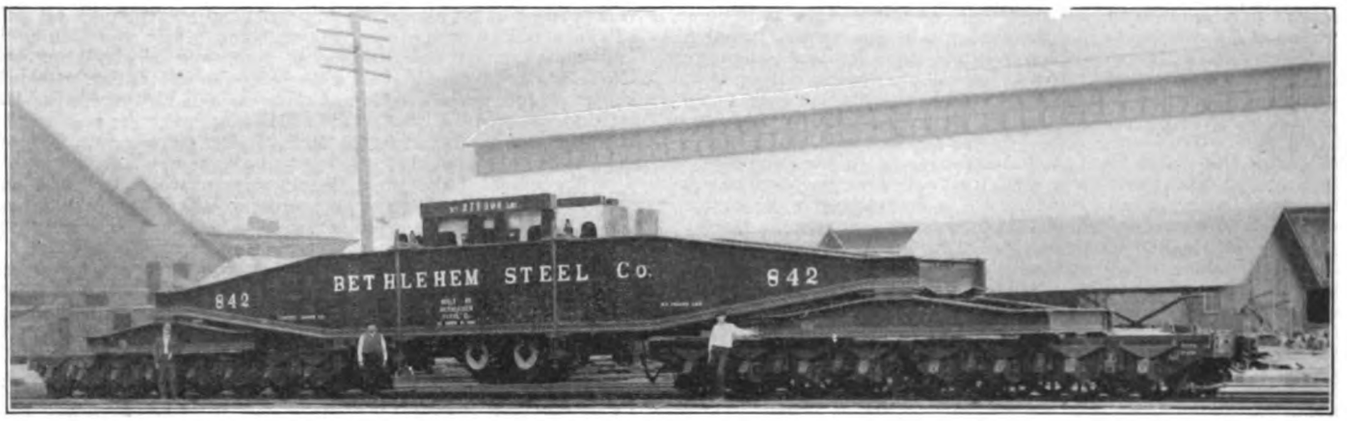

BETHLEHEM STEEL CO.'S CAR FOR CARRYING HEAVY CASTINGS—CAPACITY 300,000 LBS.

This car was built by the Bethlehem Steel Co. and is of the following dimensions: Distance between centers of king bolts, 64 ft.; length of bridge trusses, 66 ft. 10 in.; height of bridge trusses, 6 ft.; length of car over couplers, 103 ft. 10½ in.; total height of car, 10 ft. 2¾ in.; width of car 9 ft. 9 in.; capacity, 300,000 lbs; actual weight of car, 196,420 lbs; total weight of car and castings which it contains (the latter 277,000 lbs.), 473,420 lbs. The two castings are for a 12,000-ton forging press, built by the Bethlehem company for the Carnegie Steel Co. and are each of the following dimensions: Length, 21 ft 4 in.; width, 2 ft. 8 in.; height, 11 ft. 6 in.; weight of both, 277,000 lbs.

mail in those days sometimes twice in a winter, brought overland from Green Bay by dog sleds. I have carried it that way myself, and camped in a hole in the snow many a time with 30 degrees of frost. It was five to six days overland by trail to Escanaba (if you knew your way), and when you got there you weren't anywhere in particular. Our county seat was Eagle River, now in Keweenaw county, an almost forgotten town. I have gone there on foot to file papers, and got lost on my snow shoes one night coming home. I owe my rescue and probably my life to Bishop Baraga, who sent Indians out to find me. I shall never forget the entertainment John Senter and other good people of Eagle River gave me on that trip. John Senter still survives in honorable retirement. They offered me anything in their store, and I chose a can of cove oysters. I hadn't seen an oyster before in years. The pioneers of this region were as remarkable in their way as the Jesuit fathers who preceded them nearly 200 years. I have always counted it a great privilege to have known them. They showed how an American education stirs a man to go out and do things. The large sprinkling of college and university men, and men of foreign travel who came here early, had a rapid and marked effect upon me and many others.

"We were queer looking people in those early days. I do not remember when the first tall hat made its appearance, or the first dress suit; but the red shirt, the mackinaw coat and the shoe pack were full dress for a long time. Sometimes a man had no coat at all, and if he felt cold he wore a few more shirts. Travelers used to notice that the woodsmen wore fewer clothes than they would expect, and often left their throats quite bare. Yet they were a hardy race, and many more people lived to an advanced age in spite of exposure than seemed credible. This is a matter of which I have taken great notice. There are not many people now in our midst of very advanced years. But a great many people are now living elsewhere who were long residents of the Lake Superior county. And a few instances of great longevity among us are therefore not exceptional, more than in other communities. I find people a little sceptical about our old friend Kaw-baw-gam's great reported age. Now, it is true that of late anything he would tell you on the subject was not reliable; but when I came here Kaw-baw-gam was an exceptionally intelligent Indian, and I made an entry of the age he claimed at that time in my diary. In 1849 Kaw-baw-gam claimed to be fifty years old. He also told me where he had spent his previous life, and how long in each place. He could not have been far out of the way, even though he had not the exact knowledge of such things that we gain from our system of records. I am therefore nearly as certain that he lived to be 104 as I am of my own age.

"In the first two decades of the Lake Superior company I do not think it made any money, but it has always paid its debts promptly once a month, and in this connection I must not fail to give honorable mention of Richard S. Fay. He first became connected with this company in the late autumn of 1873, when the most damaging monetary panic ever known in the United States had swept over the whole country, when money could not be borrowed, even on a pledge of United States bonds of two for one. Mr. Joseph S. Fay, president of this company, called upon his nephew, Richard S. Fay of Boston, to know if he could not, through his business and English connections, raise $200.000 that the company was just then sorely in need of to meet liabilities then speedily maturing and which could not be renewed at such a time.

"Richard's reply was: 'I will cable London tonight and probably get an answer tomorrow.' The answer came promptly, 'Draw on us for $250,000 as you need it.' This carried the company past its perilous crisis and the directors were so well pleased with Richard that they at once made him general manager of the Lake Superior Iron Co. and its allied interests. When he took hold the stock of the company was selling as low as $5 a share and in a few months it advanced to par, $25, and later on for several years sold at from $50 to $80 per share. After the death of Richard S. Fay, Mr. Joseph S. Fay, Jr., was made president and general manager of the company and served as such very successfully to the time when substantially all its capital stock was sold to the present holders."

CHICAGO GRAIN FREIGHTS.

Chicago, Ill., July 1.—As readers of the Review know from daily reports, rates are steady on a basis of 1¼ cents corn to Buffalo, and the same to Georgian bay and Port Huron, with Kingston nominally 3 cents corn. Demand is slow as far as Kingston is concerned on account of congested conditions at Montreal. Chartering has been fairly active, with the feeling gradually working to a stronger level.

Crop conditions appear quite favorable, good rains in the northwest having pretty well dispelled fears concerning spring wheat. The effect will probably be more heavy marketing of country holdings. Receipts are now averaging about 600,000 bu. daily, and after this week's holiday shipments will probably take a more active turn.

SHIPMENTS (LAKE AND RAIL) SINCE LAST REPORT.

	This week.	Last week.	Last year.
Wheat	593,948	304,740	844,379
Corn	2,549,288	1,978,479	877,117
Oats	1,538,012	1,371,005	1,370,471
Total	4,681,248	3,654,224	3,091,967

	Shipments since Jan. 1, 1903.	Same time last year.
Wheat	10,325,310	13,935,996
Corn	38,106,133	16,725,239
Oats	32,801,430	26,847,589
Total	81,232,873	57,508,824

STOCKS OF GRAIN IN PUBLIC AND PRIVATE ELEVATORS.

	This week.	Last week.	Last year.
Wheat	4,485,000	4,968,000	3,336,000
Corn	6,096,000	4,424,000	5,283,000
Oats	1,291,000	1,583,000	418,000
Rye	262,000	230,000	123,000
Barley	67,000	23,000	.....
Total	12,201,000	11,228,000	9,160,000

NEW ORE DOCK AT ESCANABA.

The new ore shipping dock of the Chicago & Northwestern Ry. Co. at Escanaba, which alike to all other docks of the company at that point will be operated under the direction of H. A. Barr, agent, has begun shipping ore. This dock is 1,920 ft. long, 70 ft. high, 52 ft. 2 in. in width, and contains 320 pockets of about 200 tons capacity each, which have all modern appliances. It is a little different from other docks in that each pocket has three doors and no corners, with broad chutes.

A Philadelphia correspondent says: "A few days ago I talked with one of the Philadelphia ship builders who has never been heard from in the newspapers on the subject of American shipping in the foreign trade, but who is nevertheless a man of large interests both in shipping and ship building and of sound business judgment. Like all coast ship builders with whom I have talked on the subject, he is in favor of a shipping bill that will grant differential tariff rates to American ships without regard to their carrying capacity or speed, thus placing the owner of one vessel, be she even old and slow, on an equal footing with ocean liners, and creating a desire on the part of the foreign exporter of merchandise to the United States to ship his wares in American ships. Then, and only then, he and others think, will American ship building have a boom."

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CARING FOR NEWFOUNDLAND FISHERMEN.

While the Newfoundland and French fishermen on the Grand Banks are provided with hospital ships and the most modern medical accessories, the United States fishing fleet in the same waters is without any such humane auxiliary, and has to depend for the treatment of its sick and injured upon the ministrations of its rivals or else has to suffer the loss of time and business involved in coming to land to place helpless men under proper care. The Newfoundland medical mission has been at work now some twelve years and is splendidly organized and equipped. The mission is a branch of that which works among the British seamen and fisher folk and its extension to Newfoundland has been of immense benefit. Today it maintains three hospitals—one on the French shore and two on Labrador—each with a resident doctor, a trained English-speaking nurse, a staff of local assistants and a stout steam launch for the conveyance of patients. In addition there is a fine modern yacht, the Strathcona, a steamer of 600 tons, built by Lord Strathcona, and presented by him to the mission. In this ship the superintendent, Dr. Grenfell, cruises every season from the Grand Banks to Hudson bay, treating all who come to him for aid, regardless of race or condition, the same rule prevailing in all other branches of the mission.

The total cost of this work each year is now about $20,000, and the number of house patients (serious cases) in 1902 was 110, and of out patients 2,064. Some thirty-five operations under anaesthetics were undertaken, and eight deaths occurred in the hospitals or on the ship. The majority of these cases had no chance whatever of any other skilled assistance. It was not a question of better or worse treatment, but of suffering or dying without medical aid at all other than what the mission afforded. Some of the cases are unique in medical annals. The two-year-old child of a Labrador settler wandered away from the doorstep in the winter, and when found both her feet were frostbitten. Mortification set in, and to save her life the father chopped off both extremities with his wood axe. In due course the mission doctor reached the place with his dog sled, and found the little sufferer almost at death's door. But he treated the stumps scientifically and preserved the child in health, even if she is stricken with this infirmity. The child has now been fitted with artificial legs, and adopted by an English family. Another case is that of a little boy, the four-year-old son of the Hudson Bay Co.'s factor at Rigolet station, who was worried by savage Esquimau dogs until there were eighty-seven separate bits on his puny body. He was hurriedly brought to the nearest hospital, where he eventually recovered, though at first little hope was entertained of this.

Equally remarkable are the cures effected among the fishermen on the Banks. Most of these are surgical cases. Men are crushed by falling or breaking spars, have ribs or limbs fractured in storms, or are the victims of gunshot accidents. The Strathcona in her cruises meets most of these, and the patients are either transferred to her or, if not bad enough for this, treated on board their own vessels. If the cases are desperate or the yacht's accommodations crowded the ship is ordered to one of the hospitals and the man is housed there. Skippers, too, make for these centres of their own accord when a mishap occurs to their crews and the yacht is not near. French, Portuguese, Canadians, Americans—all avail themselves of the missions, and their generosity gets abundant play here. The story is told of one Yankee skipper who asked the hospital doctor if he would like a fresh fish for the patients, and, being answered in the affirmative, sent ashore a halibut weighing over a hundredweight and taking four men to carry. Staff and patients ate of it while they could, but had ultimately to bury its remainder some distance away, being without sufficient ice to preserve it. But, apart from this, these fishermen all pay in cash for their medicine and food, the seafarer, as a class, being about the most independent man alive, and knowing only too well from sad experience afloat what a boon it is to secure such ministrations in time of sickness or misfortune.

The ship and the hospitals have the latest devices in medical science, including the X-ray apparatus. They are lighted by electricity, and are as well kept as much more pretentious institutions. The Newfoundland fishermen, working from their own coast and Labrador, and only a day's run seaward, do not need a hospital ship so much as they do a kindred institution on shore, and that is why these three buildings have been erected. Fully 20,000 Newfoundland men are engaged in the fishery on the Banks and Labrador every season, and until the mission was established they had no medical aid whatever. Even as it is now, there is work for a larger staff than that employed, but this is naturally limited by the funds at the mission's disposal. Another work which it does that is of great good is in feeding the hungry and clothing the naked "livyeres" (live-heres, or permanent inhabitants) of Labrador, when the approach of winter threatens these wretched beings with death in its worst form—i. e., from starvation and cold.

Some idea of the misery these Labradorians endure can be realized from the fact that while the population of Newfoundland increased by 10 per cent. during the last decade that of Labrador declined from 4,211 to 3,586. The decline would have been much greater but that the mission was there to arrest it by medical services and providing food and raiment when bad fisheries left death inevitable otherwise. No more self-sacrificing life can be imagined than that of these medical missionaries ploughing the ocean in their hospital ship or making long journeys up and down the coast by boat in summer or by dog sled in winter. The dreadful monotony is broken only by the fortnightly visits of the mail steamer from St. John's, which calls at the different harbors to set off and take on mails, and from May until November the mission boats are occupied in their labors of love, affording their medical skill and creature comforts to the thousands of fisher folk who are obliged to depend for these attentions upon the philanthropic efforts alone of this splendid institution, which is doing such admirable work for stricken and suffering humanity in this land of desolation.

The hospital service for the French fishermen was established in 1899 by the Societe des Œuvres de Mer. This association fitted out a fine schooner, the St. Pierre of St. Malo, and dispatched her to the Grand Banks. She had the misfortune to be driven on the Newfoundland coast and completely wrecked on her first voyage, with the loss of four men, but she was speedily replaced by another of the same name. In 1900 this ship was again in commission, but in 1901 she was replaced with a steamer, the St. Francois d'Assise, a fine ship of 720 tons, 300 H. P. and 10 knots speed, besides a full sail plan, so that coal could be economized whenever possible. In the construction and arrangement of this ship everything that experience and ingenuity could suggest was provided for the sick and injured fishermen who were to be treated on her, she being an ideal naval hospital. She has a spacious ante-chamber, with hot water bath for the ailing and for castaways; a consulting room, a pharmacy, a library, an operating room, a surgery for dressing wounds, a disinfecting chamber and the hospital proper. This has beds for thirty-six persons, while the ship's company is twenty-seven more, including two physicians, four male nurses and a priest to minister to the spiritual needs of this floating parish.

There are about 8,000 Frenchmen engaged on the Grand Banks every summer, and last season this ship made six cruises, among them five to the outer banks and one to the inner, which face the Newfoundland "French shore." During the six months of her work she communicated with 509 French fishing vessels, had seventy-four sick persons as in patients, and treated 347 lighter cases. Besides this, she rescued twenty-one persons who were adrift in their dories and came within sight of her; twenty-six were transferred to her by other vessels which had picked them up, and she took off the sinking hull of the French schooner Navarraise eighteen others in imminent danger of death. All of these she conveyed to St. Pierre-Miquelon, where the marine authorities looked after their needs, the ship carrying stores of clothing to properly clothe such unfortunates as she might find adrift. On one occasion last year she brought in fifteen men stricken with typhoid fever—the crew of a French vessel in which the disease had raged unrestrainedly. The craft was waterlogged and helpless when the yacht sighted her, the crew having been too ill to attend to her navigation. She was set on fire after the stricken sufferers had been removed from her, and soon vanished below the waves. The crew, several of whom were dangerously ill, recovered in time, except one, who died from weakness. All would have perished but for the hospital ship. Another time she rescued the crew of eight men from a crippled lumber bark, landing them at St. Mary's, on the south coast of Newfoundland. Besides this, she distributed 11,000 letters among the French fishing fleet, and her kindly offices were freely availed of by the fishermen of other nationalities trawling on the banks.

In the course of her peregrinations during weather that was sometimes calm, but more often "dirty," she carried on her work every day, her lifeboat visiting crafts which showed a distress signal, when it was too rough for their dories to reach her. At other times she had to send back in her boats men who had come to her in dories, as these were crushed by the seas against her sides. The extraordinary incidents identified with these dories exhibit in a sombre light the difficulties and dangers of the life led by these codfishers of all nationalities. Every year there are scores of victims swallowed up by the impenetrable fogs and insatiable seas, as the little skiffs are abroad upon the waters and the pall of fog shuts down and blots out their vessels, leaving the dorymen helpless castaways, without food or water. Usually death is their fate, but if they escape that it is oftentimes only at the expense of frostbitten feet and arms, which have to be amputated after entailing agonies beside which death itself is almost preferable. French fishermen are among the worst sufferers from these causes, as they often wear sabots with wisps of straw within, and no stockings, instead of being well shod with stout woollen socks and strong rubber knee boots, as are the American and Newfoundland fishermen who frequent the Grand Banks.

That the United States fishermen have been without a hospital ship or similar institution for so long is all the more remarkable when it is remembered what philanthropy has been accomplished in other directions. It is thought that congress might make an appropriation for such a purpose, on the same principle that it maintains the life saving service. This would certainly be regarded as a most praiseworthy benefaction, offering, as it does, medical aid and the best of comforts and attention during sickness or accident to a most worthy class of workers while they pursue their hazardous occupation. It is believed that it would be a rare chance for some wealthy citizen to display his philanthropy with good effect in providing a ship which a government appropriation might maintain in the most efficient manner.

John D. Rockefeller and George Gould have secured control of the Colorado Fuel & Iron Co. As the Rockefeller interest in the steel corporation is very large, it is intimated that the Colorado company will shortly be taken into the fold.

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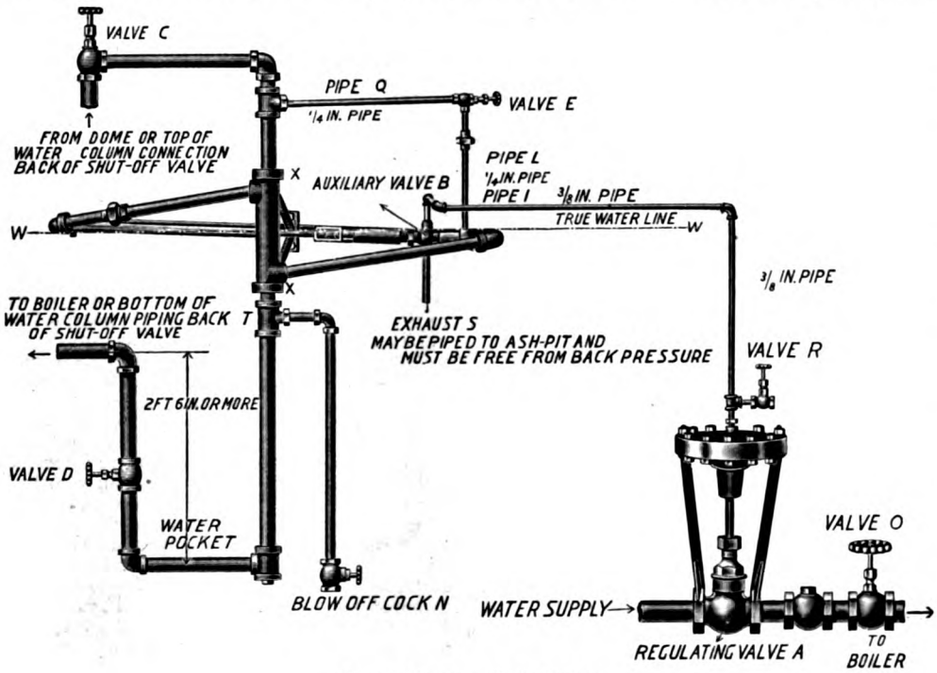
SQUIRES AUTOMATIC FEED-WATER CONTROLLER.

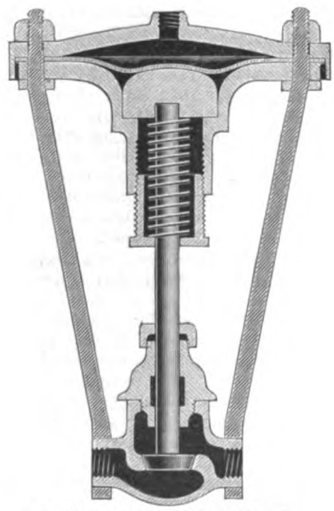
The Squires automatic feed-water controller, manufactured by the Strong, Carlisle & Hammond Co. of Cleveland, is the outcome of several years' experimenting and is offered to the public with a record of three years' operation on stationary boilers and for the past two seasons on the great lakes. The value of this device lies in the fact that the main feed valve is handled by direct boiler pressure, making it positive in all its operations and allowing it to be opened to the full extent, thus making it unnecessary to carry an excess pressure of more than 10 or 15 lbs. for feeding. This is made possible by the introduction of the auxiliary valve, for the successful operation of which a movement of not over 1-64 in. is required, this motion being automatically produced by the expansion and contraction of the copper tubes composing the harp. There is a heavy cast water-column, connected at top and bottom with corresponding points of the boiler, the middle point of the column being placed at the height of the true water line. The top and bottom of the column are connected externally by a series of heavy copper tubes called the harp, the extreme ends of these tubes being connected in a straight line as shown. This connecting link contains the mechanism by which the force exerted by the expansion or contraction of the copper tubes is utilized. It consists of the valve B with three ports and a single seat connected to one end of the harp by the stub F, the valve seat being connected with the other end of the harp by two rods which are linked together by a turnbuckle.



General Diagram of the Device.

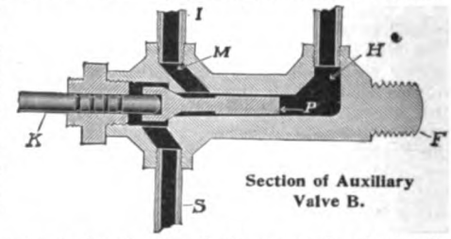
The port M of the valve B is connected by a pipe I with the regulating valve A, which controls the water supply from pump. Check valve and globe valve O are placed between A and the boiler as is customary.

The operation of the valve B is effected as follows: Through the port H steam enters from the dome or top of the boiler. It is met by the plug P, which is 1-64 in. less in diameter than its chamber. Through this slight opening enough steam escapes (through port M) to soon build up full boiler pressure on top of the diaphragm and close valve A. This shuts off the water supply completely. Evaporation continues in the boiler and the waterline falls. Steam fills a larger proportion of the copper harp than before and the left hand end (as shown in cut) expands still further. This exerts a pull which unseats the valve B, opening the lower port which leads to the air. Pressure on the diaphragm is at once relieved (exhausting through S), and the valve A is opened by the spring.



Section of Regulating Valve A.

Communication with the pump being established, the waterline rises; the harp becomes cooled and contracts, the valve B is closed and the exhaust through S ceases. The steam which seeps past the plug builds up the boiler pressure again and closes the regulating valve, cutting off the water supply. For the sake of clearness this action has been described as intermittent; it is found in practice, however, that the valves A and B will both remain open, and as a consequence there will be a steady, continuous feed, insuring an extremely level waterline, accompanied by a continuous slight exhaust through S. The method here used of operating the regulating valve gives such delicate adjustment that after the auxiliary valve has once been properly set, no further attention is necessary.



Section of Auxiliary Valve B.

With a uniform load the stroke of the pump is absolutely regular, showing that the feed-water is supplied exactly in proportion to the evaporation, and in such cases it has been found possible to detect almost no movement of the valve stem of the regulating valve. In such instances there is also a slight vaporous discharge at S, which continues at an even rate, showing that the valve B is unseated during the entire operation of the boilers.

There are but few working parts in the device, and these are so arranged as to be subjected to but little wear. The valve B being almost continuously open the pressure on its seat is rarely over 6 or 8 lbs. per square inch, and as it is not subjected to any injurious cutting, its life is practically unlimited. The harp is made very strong and rigid to withstand the stresses caused by its expansion and contraction, and the entire device is finished in the most workmanlike and attractive manner.

The claims made for this device are: It is so constructed as to allow a full opening of the feed valve; it will maintain a true waterline in surging boilers, either marine or stationary; it is simple in construction and as a consequence of this costs less for repairs and is less liable to get out of order; the operation of the controller being continuous, the greatest economy in coal consumption is obtained, because adjusting itself, as it does, to the varying demands for steam, it keeps in the boiler just the amount of water necessary to most advantageously make steam and no more.

STEAMSHIP WAR MAY BE PENDING.

It is announced that the Cunard line, which last week broke away from the North Atlantic conference, is selling through steerage tickets to points on the European continent and that the line may cut its steerage rates. This fact, in view of the recent withdrawal, has led many steamship men to believe that a rate war is contemplated by the Cunard company. Previous to the withdrawal of the Cunard line from the North Atlantic conference, an agreement was in effect that the British lines should have full sway in the British and Scandinavian passenger business, leaving the continental business to the continental lines. Until the Scandinavian-American line entered the field, the Scandinavian business was heavy for the Cunard line, but since then the line's share has fallen off. In announcing that it will take continental steerage passengers, therefore, it is supposed that the Cunard line considered that it has not got its share of the steerage business recently and intends to get it in the future.

In making a bid for the continental trade the Cunard line begins competition against the lines of the continental conference, among which are the French, Red Star, Hamburg-American, North German Lloyd and Holland-America lines. It is thought that, in order to get the steerage trade away from these lines, it will be necessary for the Cunard company to offer rate inducements. If such a move took much trade from the lines in the conference, the other lines would naturally cut to protect their interests. In that case, steamship men say, the rate agreement between them would have to be winked at or altered to suit the circumstances.

As an indication of the blockading of vessels encountered in the efforts of coal shippers to move large quantities of lake coal, it may be noted that at Milwaukee on Tuesday of this week some thirty or more coal-laden vessels were awaiting places at the twelve coal docks of that port. With a holiday coming on Saturday it will be late into next week before some of the vessels are relieved of their cargoes.

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MAKERS OF DRIVING MACHINERY FOR SHIPS.

Entirely distinctive is the position of the Marine Iron Works of Chicago in the marine field. Broadly speaking they manufacture everything that has to do with the driving of a ship. It is all summed up in this sentence: "We make a specialty of designing and building the entire and complete outfits of driving machinery for boat builders." Of course there are great advantages in a specialty of this kind. With machine shop, boiler shop, pipe and fitting-up shops, as well as boat yard and offices altogether and under one supervision, absolutely reliable work is produced with dispatch and on as economical a basis as is possible. They turn out the entire driving outfit complete ready to install and to raise steam. The company does not list its triple-expansion marine engines owing to the many combinations of sizes consequent upon the varying requirements and character of service in which the vessels are engaged, as also the average working steam pressure carried. Any of these conditions affect to a greater or less extent the relative proportions of the engine, particularly the intermediate and low-pressure cylinders. For the convenience of those desiring quotations for triple-expansion engines the company submits a list of important questions to be answered by prospective purchasers. The fore-and-aft compound marine engines built by the company are of the reliable solid-back, open-front, "bar" guide design, that permits rigidity of frame and a total of weight that is consistent with the engine efficiency. The company builds them with an exactitude of fit to justify hard service under high steam pressure and they will run cool and quiet at full speed. The company also builds a nigh speed fore-and-aft compound marine engine of light weight for launches which is especially commended.

Quite a specialty has been made by the company of modern stern-wheel paddle machinery. The noticeable advancement that has taken place in the design and efficiency of small and medium-size paddle-wheel machinery during the past few years is clearly traceable to the absolute necessity for higher power and reduced weights, resulting in many steamboats now doing a profitable business on streams so shallow that a lead pencil would almost serve as a sounding pole and on waters so rapid that until recently they were abandoned as impossible to navigate on a paying basis. The elements which enter into the design and construction of all successful steam craft are more numerous and conflicting when the boat is to be used for general business purposes on shallow, rapid rivers than is commonly understood. The machinery, equipment and power must be proportioned not only to the hull, the load and runs to be made, but more especially to the shallow water and swift currents, requiring careful distribution of the weights, while the character of the feed water, as also the kind of fuel to be burned, demands consideration. The high-working steam pressures which it is now entirely safe and proper to carry on the better class of marine boilers have done more towards successfully meeting the obstacles of river navigation than any other feature, for with engines designed, built and fitted out for steady service under such pressures the total weight of the outfit of driving machinery is very considerably reduced, as is also the space occupied. This company now builds fifty-three different sizes of stern-wheel paddle outfits.

Propeller wheels are made of iron, steel or bronze, for either speed, towing or general service, in all consistent degrees of pitch and in all sizes from 12 in. to 1 ft. in diameter. The company has enjoyed unusual success with its propeller wheels. They are also builders of Scotch boilers, Clyde boilers, Cavel capstans, steering wheels, pumps and searchlights.

MARINE ENGINEERS' WAGES.

W. I. Babcock and Thomas C. O'Sullivan, arbitrators, and Andrew Fletcher, Jr., umpire, have rendered their decision in the case of the marine engineers employed in the tug and lighterage service of the railways having terminals at the port of New York. They have gone very thoroughly into the case and decide as follows:

Engineers of boats having compound or multiple-expansion engines with low pressure cylinders 36 in. or over in diameter, wages each, day, $120 per month; night, $115.

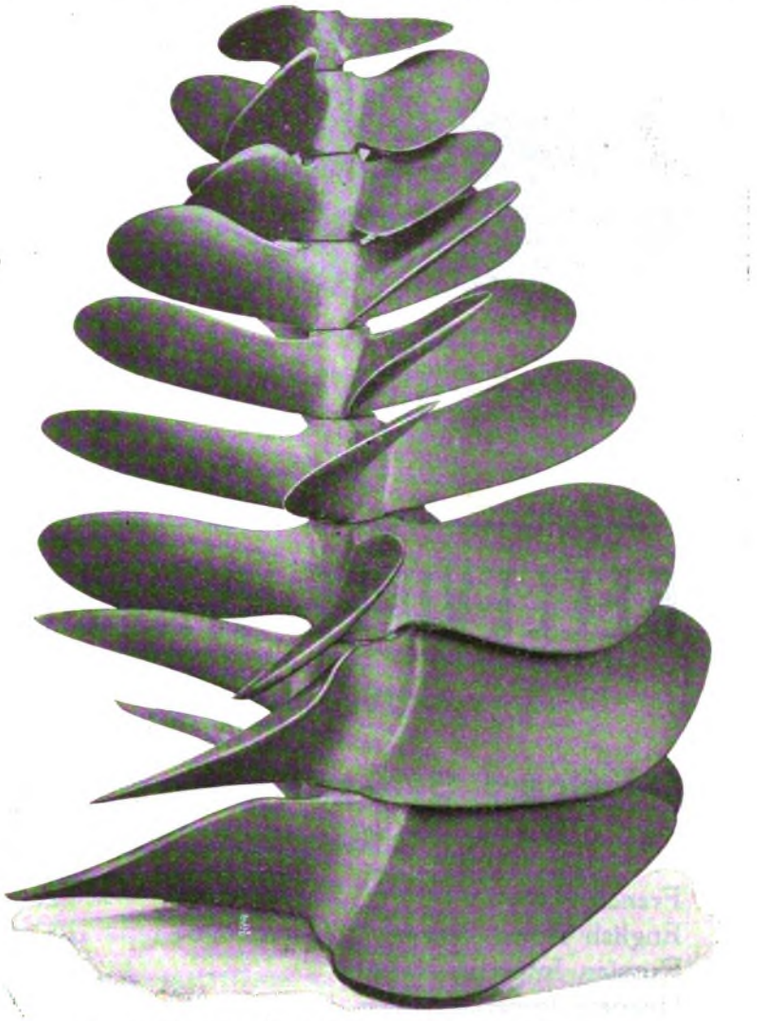
Compound or multiple expansion engines with low-pressure cylinder under 36 in. in diameter, wages each, day, $115 per month; night, $110.

Single-cylinder engines, wages each, day, $110; night, $105. These rates to be flat.

The question of meals and payment for same to be mutually agreed upon between each company and its own men. No reduction to be made in these rates when a boat is laid up for repairs or otherwise if the engineer is retained on board. Two days off each month and one week's vacation with pay shall be allowed each man. The arbitrators found that it was inconvenient to work more than two shifts every twenty-four hours, and in lieu thereof felt that the men should have a little more time off.

REPAIRS TO NAVAL VESSELS.

The usual spring epidemic of breakdowns in the navy is now manifesting itself. The navy yards of the Atlantic and Pacific coast in the last few weeks have been crowded with repair work as never before. Admiral Cotton's flagship, the Kearsarge, has recently left the New York navy yard, where she had undergone extensive repairs. The entire Pacific squadron, including the New York, the Boston, the Marblehead, the Ranger and the Bennington, has just been put in apple-pie order at the Mare Island navy yard, on San Francisco bay. The Iowa has been ordered out of commission for several months in order that she may be completely overhauled at the New York yard. It is estimated that the necessary work on the Iowa may take six months. The Illinois, flagship of Admiral Barker, commanding the North Atlantic squadron, has just left the Norfolk yard, where she was laid up some time for repairs. The Indiana is having a slight overhauling at the New York yard. The Brooklyn has had a season at the same yard and has just been released after thorough renovation. The Alabama has also just left the New York yard, after a spell of tinkering. The Columbia has had forty days at the New York yard, where the Baltimore also has had slight repairs. The Newport and the Massachusetts are at the Boston yard, while the Maine is at the Cramps' yard, where some changes are being made as the result of her first cruise. The torpedo boat flotilla has also scudded for the hospital, and not one of these delicate craft has escaped having its pulse felt and its temperature taken since the Caribbean maneuvers.



A Bunch of Propeller Wheels Selected at Random and Photographed.

Secretary W. L. Capps of the Society of Naval Architects and Marine Engineers is already making preparations for the annual meeting to be held in November. In a circular to members of the society he says: "The executive committee of the council invites suggestions concerning papers to be read at the eleventh annual meeting to be held in New York in November next. It is quite important that the papers should be in print thirty days before the meeting so that they can be distributed in advance. Members who desire to submit papers or who have suggestions to make are requested to communicate with the secretary at their earliest convenience. Further information on the subject of papers to be presented at the eleventh annual meeting will be furnished on application to the secretary."

Officers of the Buffalo Merchant Exchange announce that the name of the organization has been changed to Chamber of Commerce of Buffalo.

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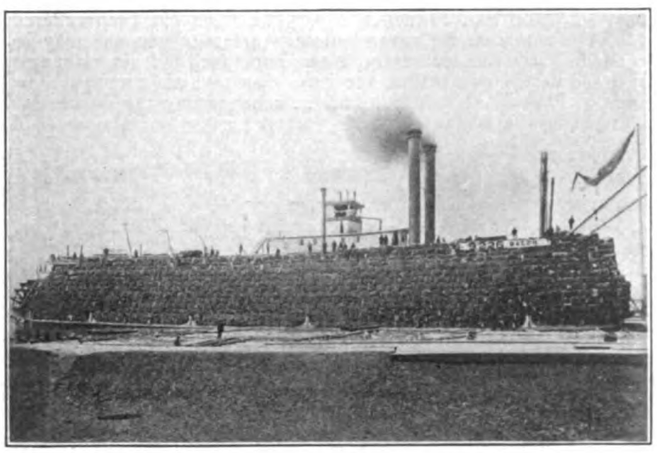
LARGEST COTTON CARRIER.

Accompanying this article is a photograph of the steamer Henry Frank, a Mississippi river product, which had in her day the distinction of being the largest cotton carrier in the world. The photograph was taken twenty-two years ago. She arrived in New Orleans on April 2, 1881, with 9,226 bales of flat cotton (not compressed) and 250 tons of other cargo. It will be observed that it is piled fourteen, and in some cases fifteen tiers in height. Capt. P. J. O'Reilly of New Orleans, who sends this photo to the Review and who was interested in the steamer, says that the whole town of New Orleans turned out to see the immense cargo. The Henry Frank was the last of the big cotton carriers, the inroads of the railway making their construction unprofitable.



Steamer Henry Frank and Her Load of Cotton.

SHIP YARD NOTES.

The steamer Umatilla, which has been undergoing extensive repairs and overhauling at Moran Bros.' ship yard, Seattle, Wash., is about ready to leave. About $150,000 has been expended on her, amounting almost to a total rebuild.

J. B. C. Lockwood and J. A. Sloan, Tacoma, Wash., have just launched the ocean-going dredger Pacific for the North American Dredging Co. The Pacific is 160 ft. long, 34 ft. beam and 16 ft. deep. She is to be towed to the works of the Moran Bros. Co., Seattle, Wash., where her boilers will be installed. She will cost complete $180,000.

A contract was awarded last week by the quartermaster of the army to the Neafie & Levy Ship & Engine Building Co., Philadelphia, for the construction of four submarine double-bottom boats, to be used in the defense of New York harbor, and by the school of submarine defense at Fort Totten. The contract price is $122,000 each. The Maryland Steel Co., Sparrow's Point, Md., was also given a contract for the construction of a single-screw harbor-defense transport for use in New York harbor at $88,000 and to the Risdon Iron Works, San Francisco, for constructing a quartermaster's supply transport vessel for San Francisco harbor at $110,000.

At the Kelley-Spear Co.'s yard, Bath, Me., workmen are busy with several craft. The towboat building for the Staples Coal Co. is in frame. She will be christened Quequechan and will tow vessels in the Taunton river. The steam lighter Reliance, building for Rowe Bros., Portland, Me., will be launched in about ten days. She is 125 ft. long, 30 ft. beam and 10 ft. deep. The three-masted schooner building for Charles S. Hirsch of New York has a number of frames in place. She is to be 140 ft. long, 35 ft. 6 in. wide and 13 ft. deep. The flat-bottom lighter for Hudson Bros. has been started, her stern post being in place. She will be 203 ft. long, 35 ft. wide and 13 ft. deep. Her masts will be 75 ft. long and of Oregon pine.

The Pentucket, an ocean-going tug under construction at the Charlestown navy yard, is nearly completed. The tug is of steel, 92 ft. long, 21 ft. wide and 9 ft. deep. She is schooner-rigged and will cost about $70,000.

BELLEVILLE WATER-TUBE BOILERS

NOW IN USE (FEBRUARY, 1903)

On Board Sea-going Vessels, NOT INCLUDING New Installations Building or Erecting.

French Navy	276,460 H. P.
English Royal Navy	849,300 "
Russian Imperial Navy	193,900 "
Japanese Imperial Navy	122,700 "
Austrian Imperial Navy	32,900 "
Italian Royal Navy	13,500 "
Chilian Navy	26,500 "
Argentine Navy	13,000 "
The "Messageries Maritimes" Company	87,600 "
Chemins de fer de l'Ouest: (The French Western Railway Co.) Steamships plying between Dieppe and Newhaven	18,500 "
Total Horse Power of Boilers in Use	1,634,360

WORKS: Ateliers et Chantiers de l'Ermitage, at Saint-Denis (Seine), France.

TELEGRAPHIC ADDRESS: Belleville, Saint-Denis-Sur-Seine.

United Marine Mfg. & Supply Co.,

MANUFACTURERS OF AND DEALERS IN

ELECTRICAL MATERIAL

ALBERT C. JAHL, General Manager,
100 William St., New York, U. S. A.

FOR SHIPS AND FORTIFICATIONS.

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United States Minister Thompson at Betropolis, Brazil, reports to the state department that the government has embarked upon a plan for vast harbor works at Rio, involving the building of 2,104 miles of stone dock. The cost of this great work will be 042,000,000 to be raised through a loan placed by the Rothschilds. The bonds are to be sold at 90 per cent. and bear 5 per cent. interest, being secured by dock charges of 3 per cent. on merchandise. In spite of Mr. Thompson's efforts the work has been let to a British firm.

The management of the Canada-Jamaica Steamship Co. has announced that a third steamer will be placed on the route from Jamaica to Canada. Sydney Oliver, the colonial secretary of Jamaica, who went to Canada to promote closer commercial relations, met with an encouraging reception. The United States is more largely interested in the trade of the island than any other country, having taken last year 84,000,000 of the 90,000,000 oranges exported, nearly all the coffee and most of the bananas.

Capt. W. J. Smith, principal of Seattle Nautical College, has written a book on "Practical Compass Adjustment on Iron, Composite and Wooden Vessels." He goes thoroughly into compass deviation, its various causes and proper cures. The book is designed to help those of the seafaring community who have had little or no experience in actual compass adjustment. The work is that of a practical man who spent many years at sea himself. It may be had from the Marine Review.

For the purpose of furnishing current to the arc lamps at the Allouez ore docks on Lake Superior, which are the largest iron ore docks in the world, the Great Northern Railway Co. has recently purchased from the Westinghouse Electric & Manufacturing Co. two 75-kilowatt, 2,200-volt, two-phase generators, complete with two 5.62-kilowatt exciters, and a four-panel switchboard. The order also calls for seven 7½-kilowatt and one 2½-kilowatt O. D. type transformers.

Reports of recent circulation that the United States Steel Corporation is endeavoring to obtain possession of the iron ore mines in South Veranger, Norway, are without foundation.

National Educational Association convention, Boston, July 6 to 10, very low rates and special inducements via Nickel Plate road. Tickets on sale July 2, 3, 4 and 5, good returning July 12, subject to extension of return limit to Sept. 1, if desired. See nearest agent or address E. A. Akers, C. P. & T. A., Cleveland, O.

99, July 2.

The Blue Book of American Shipping

is a marine directory and is the only one published in the United States.

It contains a correct list of names and addresses of ship builders, engine and boiler builders, vessel owners, steamship lines, repair yards, dry docks, dredging companies, marine engineers, captains of vessels and all persons identified with shipping and its allied trades.

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It is the biggest Five Dollars worth of advertising to be had anywhere.

The 1903 edition of the Blue Book is now in course of preparation, therefore promptitude is a necessity if you desire your name to be inserted in the classified directory.

The price of the Blue Book is $5.00 and it is delivered free of carriage.

MARINE REVIEW PUBLISHING CO.,
39-41 Wade Building,
Cleveland, Ohio.

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*SUCTION DREDGERS—ROTARY CUTTERS.

By James Henry Apjohn.

The development of hydraulic dredgers has placed in the hands of engineers a tool of enormous power, and the great results achieved by them on the bars of the Mersey and other rivers are well known. They have hitherto been chiefly employed on sand or light silt, which yields to the current drawn into the nozzle by the action of the pumps. To enable a suction-dredger to deal with clay, it is necessary that the clay be first cut up, as the current is insufficient to disintegrate it. For dredging clay, rotary cutters fitted to the nozzle of the suction-pipes have been used. These consist of a number of knives (ten to fifteen), united by suitable discs or rings at one or both ends. The knives may be either straight or spiral, and are mounted around, and concentric with, the end of the suction-pipe. The whole cutter may be secured to the end of the suction pipe, and rotary motion imparted to both together, or the cutter shaft may be journaled in a suitable bearing provided in the end of the suction pipe, which is then made stationary.

The author's experience of rotary cutters has been with a dredger designed for the purpose of excavating clay for dock extension. The clay being silty, it was thought that it would be easily broken up by the cutter, but this was not the case. The cutter had fourteen straight knives, set at an angle of 26° to the tangent of the circle round which they were placed, and overlapping each other to a slight extent. The dredger was first operated at a small depth, where the soil was loamy, and the cutter proved efficient; but when the clay was reached at a greater depth, the openings between the blades of the cutter clogged with the tenacious plastic clay, with the result that the proportion of clay found in the water discharged through the pipe line was extremely small. The cutter was then unshipped, and a width of some inches was cut off the inner edge of each blade; so that the overlap was done away with, and at the same time the circular opening at the bottom of the cutter was reduced in area. When again tried the cutter worked better, there being but little clogging between the blades, but these did not cut the clay very well. A new cutter was then built, with narrow spiral knives, and proved to be more efficient than the first; but even with this cutter the quantity turned out per hour was never more than 60 per cent. of that contracted for. The clay, which it discharged behind the walls, was in the form of nodules, varying in size between that of an egg and that of a Dutch cheese. The form of the discharged clay shows that it is clay, and not, as has been asserted, silt easily disintegrated by water. If it had been the latter, it would, after passing through the pump and line of pipes, have been discharged in the form of mud, and not as hard balls, as was actually the case.

The dredger worked radially, pivoting on one of two "spuds" abreast of each other in the stern, the bow being swung by breastlines. Having completed the arc, the other spud was dropped and the one in use was raised, so that the dredger advanced step by step against the breast she was cutting. The depth cut on each arc was about 2 ft., and the bottom was left practically quite level —very different from that left by a bucket-dredger. This dredger, where the material dredged is discharged directly as backing for the walls and for the raising of low land behind them, is considerably more economical than a bucket-dredger, where the material has first to be discharged into barges, from which it is again carried and placed on the land. The efficiency of a cutter evidently depends on the form of the blades, the angle at which they are set, and whether they are straight or spiral, and on the openings between them and at the bottom. To determine absolutely the best form for each description of clay to be cut would involve numerous and costly experiments which have not as yet been made.

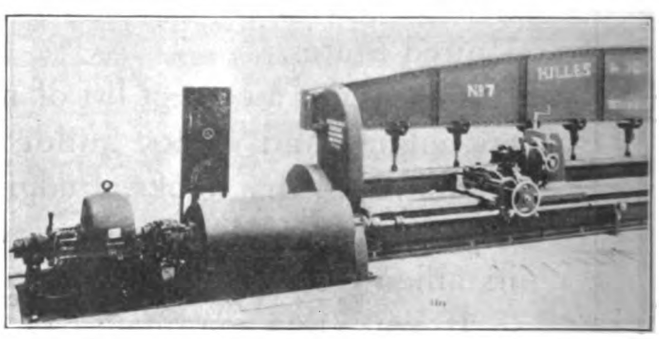
The dredger was tried experimentally in the river to see what she could do on sand. In a depth of about 10 ft. of water, and discharging back into the river through about 300 ft. of floating pipe-line, she excavated 113,825 cu. ft. of sand in 5½ hours, or at the rate of 21,500 cu. ft. an hour. The quantity excavated in the bed of the river was determined by soundings before and after the dredging operations. She was afterwards used for land reclamation, dredging sand from the river bed and discharging it on to the bank, through 600 ft. to 900 ft. of pipe, with a lift of 17 ft. on an average. Under these circumstances she discharged 6,500 cu. ft. an hour, or 16½ per cent. in excess of the contract quantity for clay. She was subsequently tried on improving a bar in the river, which had shoaled. The bar was about 800 ft. in width, and the dredger was run three times across it on the same line, discharging to one side back into the river, through the floating pipe-line. She was only worked during such times as there was sufficient current in the river, on either the flood or ebb tide, to carry the dredgings to some distance. The operations extended over 2½ days, and resulted in an improvement of the crossing by about 2½ ft. for the width required for vessels. As the dredger was only run on one line, the width to which the crossing was improved shows that the cut made by the dredger had the effect of causing the current to continue what the dredger had commenced. During these operations on the bar the "spuds" were not used, the dredger working on head and stern lines. The tendency of the cutter to cant her out of line was counteracted by a steam hopper barge lashed on one bow.

The effect on the cutters of working in sand was to wear the blades to a considerable extent, but the bearings kept in good order, the sand being excluded from them by an arrangement by which they are lubricated by water under pressure. For working in sand, water-jets for breaking down the material to be dredged are preferred by the engineers on the Mississippi to rotary cutters. Interesting particulars of the dredging of this river will be found in "Notes on the Engineering Works of the Mississippi River," by Mr. E. F. Dawson, associate member of the Institution of Civil Engineers, executive engineer, public works department, Bombay presidency, published in Calcutta by Mr. Thacker Spink in 1900. Mr. Dawson was deputed by the government of India to visit and report on the improvements on the Mississippi. At first water-jets, nine or ten in number, 2¼ in. to 3 in. in diameter, with a pressure of 14 lbs. per square inch, were used, but subsequently much better results were obtained by jets 1½ in. in diameter, six in number, with a pressure of 65 lbs. per square inch.

*Paper read at Engineering Conference, Institute of Civil Engineers, London.

HEAVY PLATE PLANER AT CHARLESTOWN YARD.

The accompanying illustration shows a 32-ft. heavy plate planer built by Messrs. Hilles & Jones of Wilmington, Del., and recently installed in the United States navy yard at Charlestown, Mass. Direct connected to the main driving screw of the planer,

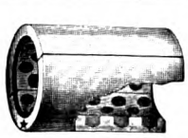


through gearing and magnetic clutches, is a 50-H. P. Westinghouse multipolar motor of 220 volts and running at slow speed, which furnishes ample power to enable the machine to plane 2-in. armor plate, taking a heavy chip. A thorough test proved the machine to be a powerful tool in every respect. The saddle of the planer is designed to carry two tools, one cutting in each direction, also a third tool for vertical feed, the saddle and tool holder being shifted automatically at any point desired.

Mystic Shriners Imperial Council at Saratoga, N. Y., July 7-10, excursion rate, one fare for the round trip by way of the Nickel Plate road. Tickets on sale July 5 and 6, good to return July 20. Full particulars at nearest ticket office, or address E. A. Akers, C. P. & T. A., Cleveland, O. 102, July 2.

Sand Sucker for Sale.

For Sale—Sand sucker of about 175 tons capacity. Equipped with 8-inch pump. In first-class condition, ready for business. Price right. Louhoff Bros, 35 Chene St., Detroit, Mich. July 23



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NEW FAVORITE IN ANCHORS.

The Admiral Anchor Co. of Chester, Pa., has just shipped two car loads of "Admiral" anchors to Sault Ste. Marie, for use on lake vessels. This is by no means the first shipment of this anchor to the great lakes, as several vessels plying thereon already carry it, and report says it is found to fill every requirement under all conditions. That the anchor seems to be rapidly coming into favor with vesselmen is manifest from the fact that while the patent under which the anchor is manufactured was only issued in January, 1901, and the company has been in business less than two years, they are running to full capacity, with expectations of soon having to increase facilities. It is reported that in the first six weeks of the company's quest for business, Mr. S. S. Tompkins, secretary and treasurer, who has charge of the sales department, took over $12,000 worth of orders individually, and that the first year's sales amounted to over 1,000,000 lbs. of anchors. This is a record which few new concerns in any line can show, and speaks eloquently both as to Mr. Tompkins' business ability and the merits of the "Admiral" anchor. The anchor is made in all sizes from 40 lbs. to 17,000 lbs., and possesses features that make it a superior article in stockless anchors, which will account for its rapid rise to popularity.

The Admiral Anchor Co. is manned by young blood, full of brains, energy and push, which, added to the merits of their product, augurs well for its future prosperity.

PROSPEROUS MARINE HARDWARE MANUFACTORY.

The Marine Supply Mfg. Co. of Wilmington, Del., a concern that has been in business but nine months, is so crowded with orders that the works are compelled to run day and night in order to supply the demand. The company had but fairly got started when it was found necessary to enlarge the foundry to double its original capacity, the building having to be enlarged to twice its length for the purpose. This improvement has been lately completed, and now, as a representative of the Marine Review and Marine Record is informed by both Mr. C. F. Petersen, the president, and Mr. C. L. Bouham, the secretary, they are compelled to consider other extensions and improvements. This agreeable state of affairs was accounted for by Mr. Petersen, who modestly said: "We make good goods and the ship builders and vesselmen seem to like them." They manufacture all kinds of brass ship fittings and marine hardware, also coaling scuttles, etc., making a specialty of their patent "one snap air port," which has met with great favor. Orders on hand are sufficient to keep the works running for some months

PATENT HAWSE PIPE

Mr. Joseph Kidd of Duluth, who is connected with the Pittsburg Steamship Co., has lately obtained a patent on a hawse pipe for ships' anchors. This pipe is so arranged that the flukes of the anchor go inside the vessel, while the head comes taut up to the ship's side and closes the hole. By this device the anchor, which heretofore has projected from 2½ to 5 ft., is made to lay close in, where it is out of harm's way in case of collision and cannot be buffeted by rough seas, while the shipping of water through the hawse pipe is obviated. It is expected that the device, which is especially designed for stockless anchors, will soon be on the market and will be duly appreciated by vesselmen.

On July 1, after a service of twenty-five years, Mr. Stephen W. Baldwin retires from the management of the New York office of the Pennsylvania Steel Co. He retains his connection with the company in an advisory capacity and as consulting engineer with headquarters at 71 Broadway, same as heretofore. Mr. A. E. Aeby, his first assistant for the past fourteen years, has been appointed to take charge of the New York office in the capacity heretofore filled by Mr. Baldwin.

Francis H. Clergue, accompanied by thirty members of the legislature of both political sides, waited on the government of Canada recently and asked for a land subsidy for a railway to be built from Sudbury to Scotia Junction, to connect the Clergue system projected from Sudbury to Sault Ste. Marie with the railway systems of old Ontario by an air line crossing near the mouth of the French river.

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For Sale—Passenger and freight steamer Urania. British registry. Built at Milwaukee in 1875 and then named Flora. Rebuilt in 1899 with engines from revenue cutter Andrew Johnson. Wooden hull. Three decks. Length 180 ft.; breadth 27 ft. 4 in. Thirty-three staterooms, 98 berths. Allowed 98 first-cabin and 402 steerage passengers. Speed 13 miles. Electric light plant practically new. Engines and boilers were thoroughly overhauled when transferred to this hull and have been well kept up. Urania has been running between Cleveland and Port Stanley and fuel consumption for day and night trips on run was about 400 tons per month. Address Box 41, the Marine Review Pub. Co., Wade Bldg., Cleveland. tf.

Boiler and Engine for Sale.

Both in first-class condition Boiler 10½ ft. in diameter and 14 ft. long; 120 lbs. steam allowed Fore and aft compound engine; high-pressure, 22 in. diameter low-pressure, 44-in., with 36 in. stroke Address Barry Trans Co., East End Michigan St., Chicago, Ill. t f

For Sale.

One 18x6 Air Hoist Cylinder, two round ore buckets, bottom dump 26x35. Harris Machinery Co. Minneapolis, Minn. July 16.

Steam Barge for Sale.

For Sale.—Steam barge, 131 ft. keel, 25 ft. beam, 9 ft. deep. Capacity, lumber, 260 M. ft.; coal, 375 tons. Good power; can handle two or three barges. Everything pertaining to this boat is in good condition. Terms cash. Address Belknap & Phillips, Lock Box 35, St. Clair, Mich. July 16.

Towing Machine for Sale.

For Sale —A latest type towing machine. Cost one year ago $2,500. Placed on board ship but never used. Address for particulars James Reilly Repair & Supply Co., 229-230 West street, New York City. June 25.

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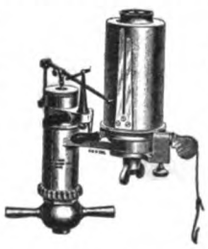

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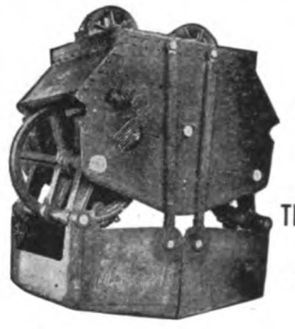

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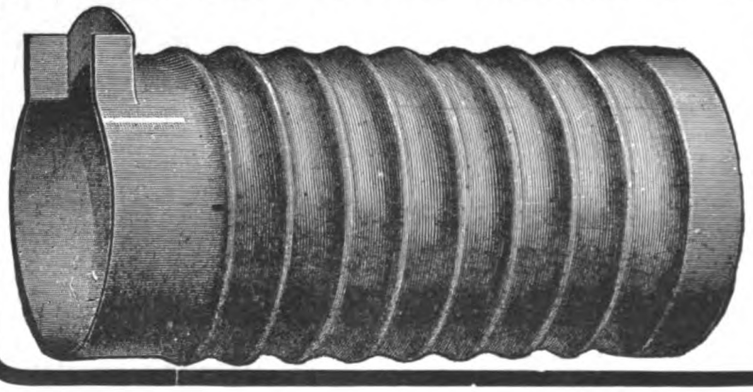

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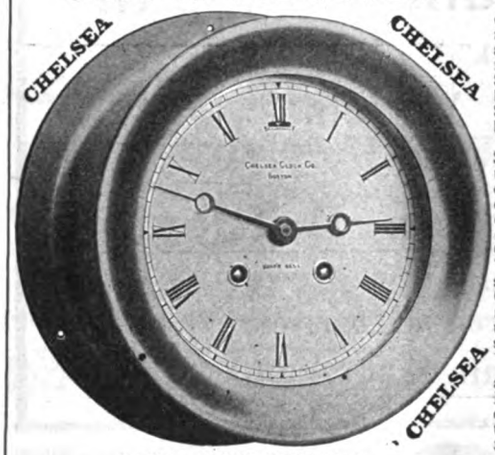

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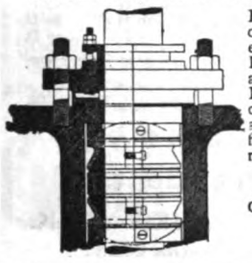

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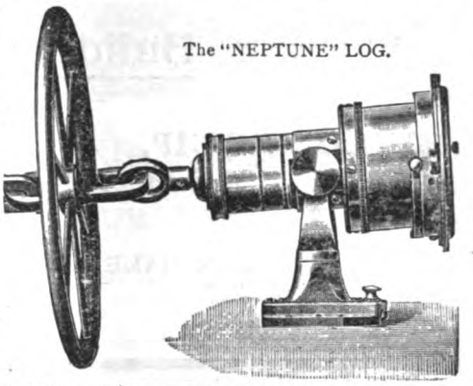

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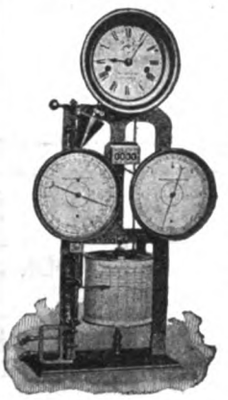

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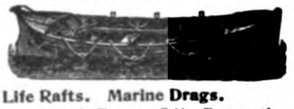

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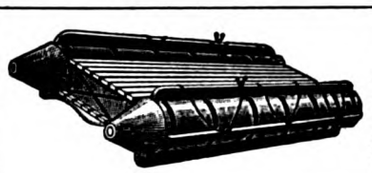

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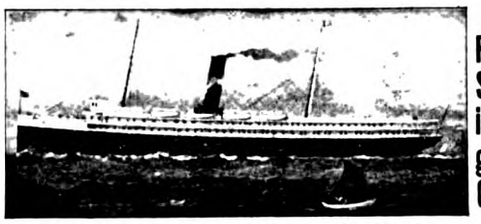

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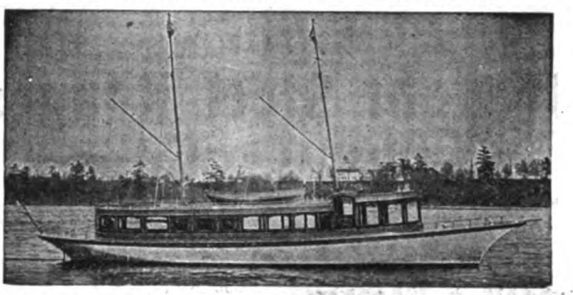

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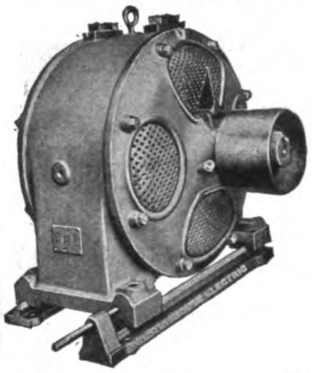

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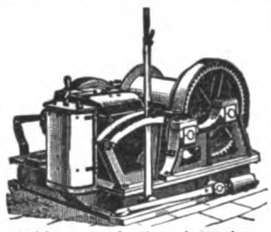

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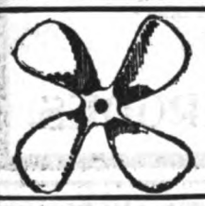

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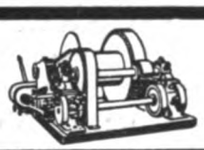

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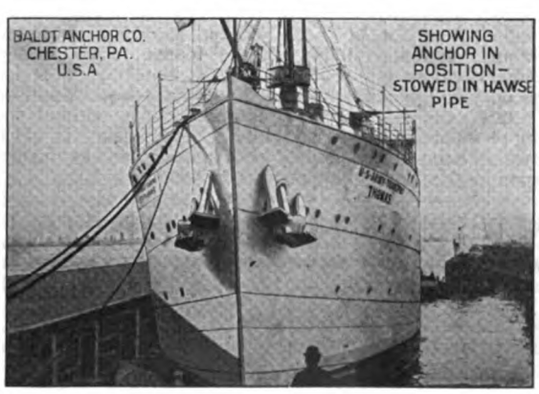

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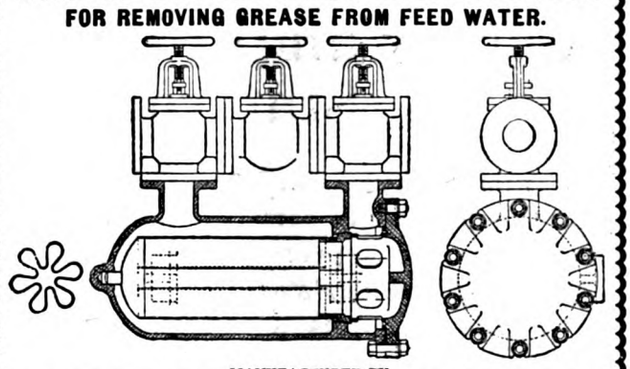

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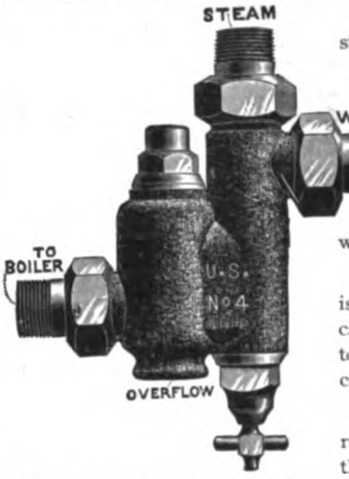

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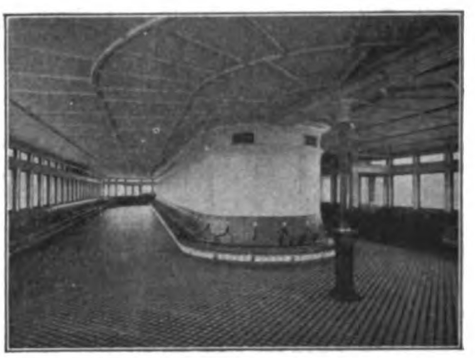

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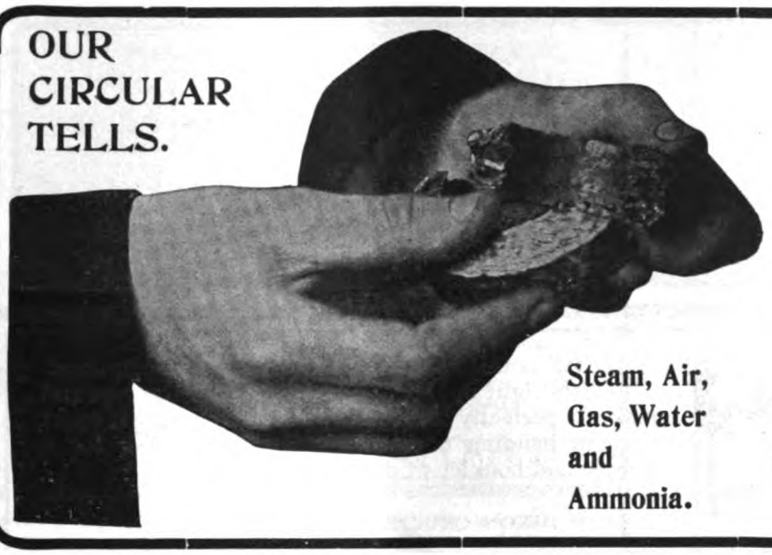

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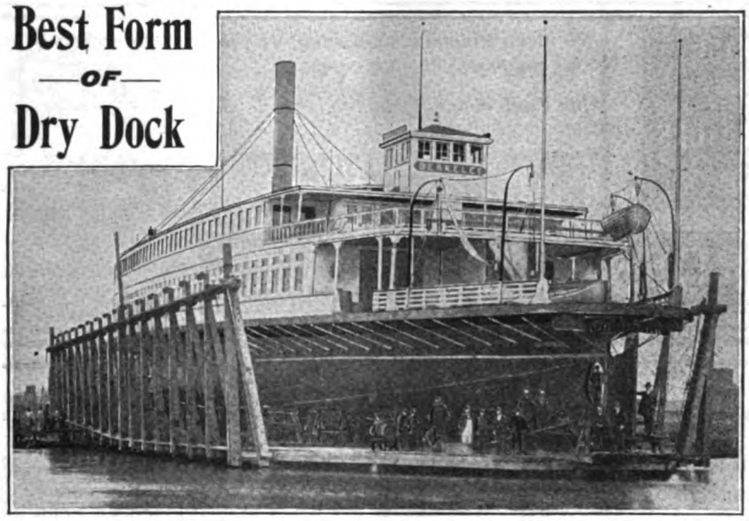

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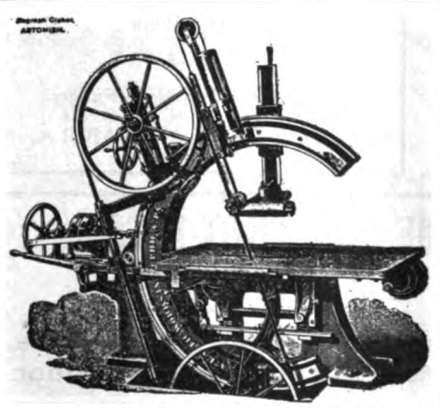

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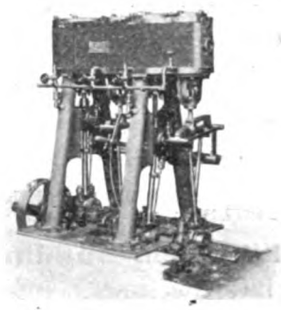

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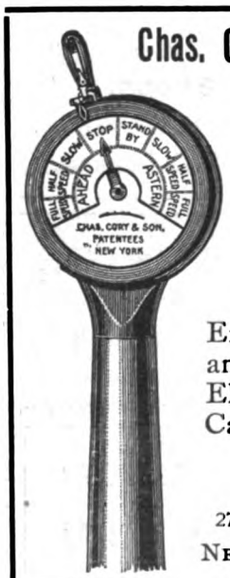

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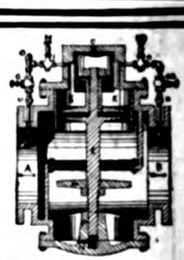

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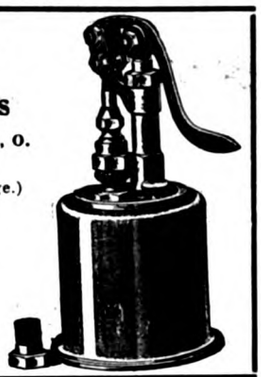

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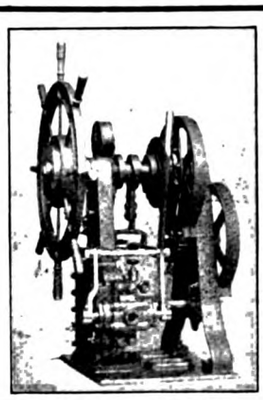

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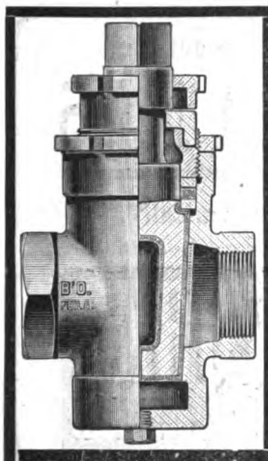

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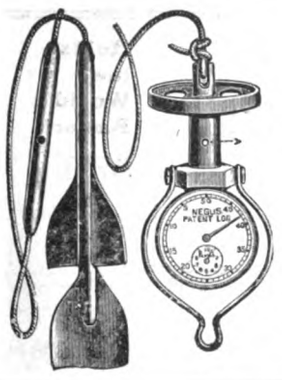

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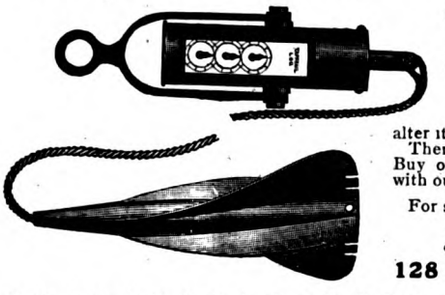

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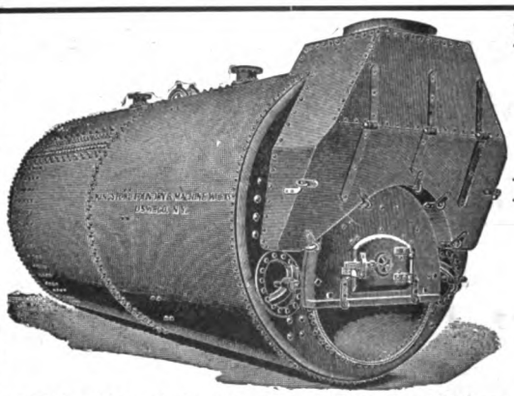

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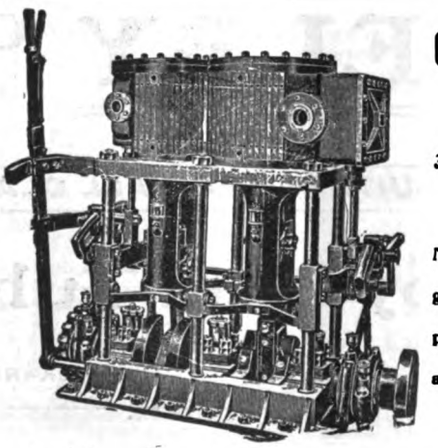

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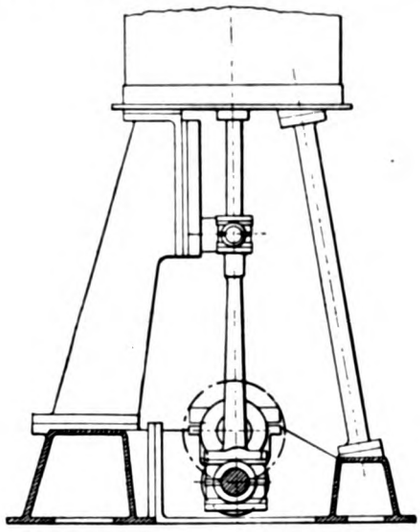

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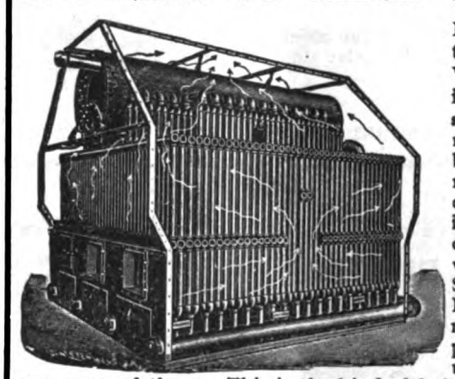

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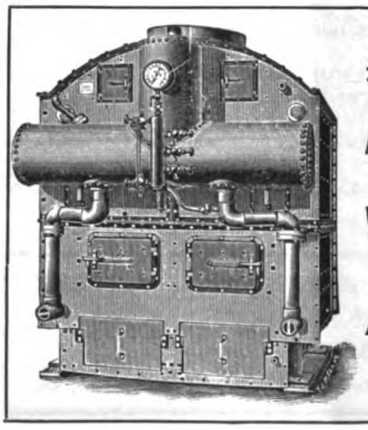

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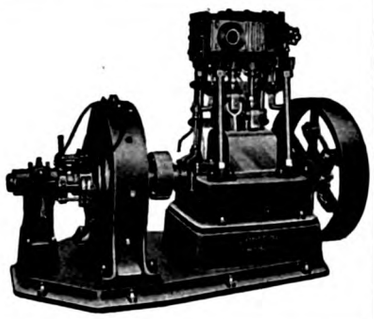

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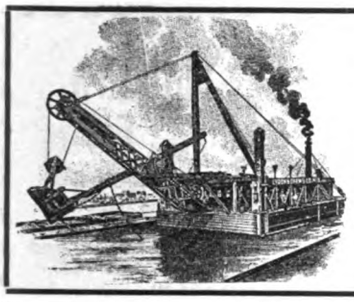

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U. S. Engineer Office, Grand Rapids, Mich., June 22, 1903. Sealed proposals for steam plant for suction dredge will be received here until 3 p. m., July 22, 1903, and then publicly opened. Information furnished on application. M. B. ADAMS, Lieut. Col., Engrs. July 16.

U. S. Engineer Office, Detroit, Mich., June 18, 1903. Sealed proposals for building concrete superstructure on main pier at Sand Beach harbor of refuge, Mich., will be received here until 3 P. M., standard time, July 18, 1903, and then publicly opened. Information furnished on application. LANSING H. BEACH, Major, Engrs. July 16.

U. S. Engineer office, Jones Bldg., Detroit, Mich., June 23. 1903. Sealed proposals for hire of two or three dredging plants for use in lower Lake Huron, St. Clair River and Lake, and upper Detroit River, will be received here until noon (standard time) July 23, 1903, and then publicly opened. Information furnished on application. W. H. BIXBY, Major, Engrs. July 16.

U. S. Engineer Office, Witherspoon Building, Philadelphia, Pa., June 18, 1903. Sealed proposals for constructing two steel, twin-screw, suction dredges, will be received here until 12 noon, July 18, 1903, and then publicly opened. Proposals for constructing both dredges or one will be received. Information furnished on application. J. C. SANFORD, Capt Engrs. July 9

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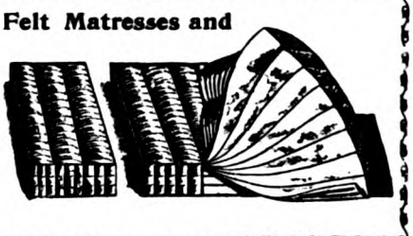

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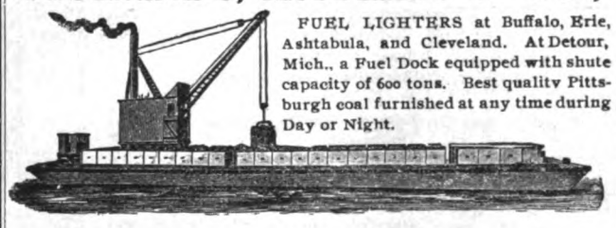

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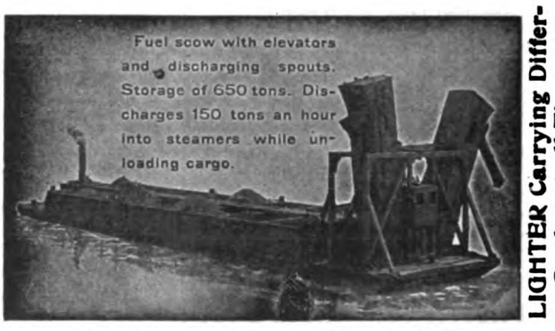
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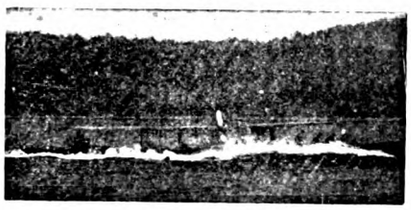

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Harbor Entrance.
Unloading Ore—Brown Conveying Hoists, two views.
Unloading Ore—Clam Shell Plant.
Car Dumping Plant, two views.

DETROIT, MICH.
Winter in Detroit River.
Car Ferry turning in ice—two views.
"Michigan Central" entering slip.

DULUTH, MINN.
Great Northern Elevator.
Peavey Elevator.
Ship Canal (Looking in) Two views.
Ship Canal (Looking out.)
Flour Mills.
Northwestern Coal Docks.
Philadelphia & Reading Coal Docks.
The Harbor.
The Bluffs.
"Last Trip From Duluth."

ERIE, PA.
Anchor Line Docks and Pennsylvania R. R. Co.'s Ore and Coal Docks.
Pennsylvania R. R. Coal Trestle.
Pennsylvania R. R. Co.'s Docks. Unloading Ore
Hanna's Ore Plant.
Coal Trestle and Car Dumping Plant.

OSWEGO, N. Y.
Coal and Ore Docks.

ST. CLAIR FLATS.
Str. Tashmoo Entering Ship Canal.
A Freighter Leaving Ship Canal.
Lake Vessels Old and New.
Nightfall on the River.
A Lumber Tow.

SAULT STE. MARIE, MICH.
General View of Locks from Offices.
Poe Lock, from below, closed.
Poe Lock, from below, open.
Poe Lock, from above.
Poe Lock, with Whaleback.
Weitzel Lock, from above.
Weitzel Lock, from below.
Str. North-Land Passing Locks, two views.
Upper Entrance to Lock Canal.
Gate Mechanism.
Interior of Power House.
Canadian Lock from Upper End.
Canadian Lock from Lower End.
The Rapids, looking up.
The Rapids, looking across.
Indians fishing in the rapids.

PANORAMIC VIEWS.—7x17 inches at $1.75 each.
Lackawanna Ore Docks—Unloading ore.
American Steel & Wire Co.'s Plant, Cleveland.
Ore Docks and Harbor, Cleveland.
Ore Docks, Cleveland.
Water Front, Detroit, from Windsor.
Coal and Ore Docks at Oswego.

Address: MARINE REVIEW PUB. CO.,
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BUYERS' DIRECTORY OF THE MARINE TRADE.

For a more complete classification than that represented by advertisers in the Marine Review and Marine Record, see the BLUE BOOK OF AMERICAN SHIPPING, marine and naval directory of the United States, published by the Marine Review Pub. Co., 39-41 Wade Bldg., Cleveland.

See accompanying Index of Advertisers for full addresses of concerns in this directory.

AIR COMPRESSORS, AIR HOISTS, ETC.

Chicago Pneumatic Tool Co.....Chicago.
"Long Arm" System Co.....Cleveland.

AIR PUMPS AND APPLIANCES.

Fore River Ship & Engine Co.....Quincy, Mass.

ANCHORS.

Baldt Anchor Co.....Chester, Pa.
Bowers, L. M. & Co. .....Binghamton, N. Y.
DeGrauw, Aymar & Co. .....New York.
Seaboard Steel Casting Co.....Chester, Pa.

ANTI-FRICTION METALS.

Cramp, Wm. & Sons.....Philadelphia.
Hardy, Wm. A.....Fitchburg, Mass.
Phosphor Bronze Smelting Co., Ltd....Philadelphia.
Pittsburg White Metal Co. .....Pittsburg, Pa.

ARTIFICIAL DRAFT FOR BOILERS.

American Ship Building Co.....Cleveland.
Bloomsburg & Co., H.....Newport News, Va.
Buffalo Forge Co.....Buffalo.
Detroit Shipbuilding Co.....Detroit.
Sturtevant, B. F. Co.....Boston.

ATTORNEYS AND PROCTORS IN ADMIRALTY.

Brown, Harvey L.....Buffalo.
Gilchrist, Albert J.....Cleveland.
Goulder, Holding & Masten.....Cleveland.
Hoyt, Dustin & Kelley.....Cleveland.
Kremer, C. E. .....Chicago.
MacDonald, Ray G.....Chicago.
McPherson, Clark, Campbell & Jarvis.....Toronto.
Pinney & Warner.....Cleveland.
Shaw, Warren, Cady & Oakes.....Detroit.
Spencer, H. R.,.....Duluth.
White, Johnson, McCaslin & Cannon.....Cleveland.

BANKERS.

Fabey & Co.....Cleveland.
Federal Trust Co. .....Cleveland.
Cleveland Trust Co.....Cleveland.

BAROMETERS, MARINE GLASSES, ETC.

Bliss, John & Co.....New York.
Ritchie, E. S. & Sons.....Brookline, Mass.

BELTING, RUBBER.

New York Belting & Packing Co.....New York.

BLOCKS, SHEAVES, ETC.

Boston & Lockport Block Co.....Boston, Mass.
Cleveland Block Co.....Cleveland.

BLOWERS.

Buffalo Forge Co.....Buffalo.
Sturtevant, B. F. Co.....Boston.

BOAT BUILDERS.

Drein, Thos. & Son.....Wilmington, Del.
Kahnweiler's Sons, David.....New York.
Lane & DeGroot.....Long Island City, N. Y.
Marine Construction & D. D. Co., ...
.....Mariner's Harbor, S. I., N. Y.
Marine Iron Works.....Chicago.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Warrington Iron Works..... .....Chicago.
Willard, Chas. P. & Co.....Chicago.

BOILER MANUFACTURERS.

Almy Water Tube Boiler Co.....Providence, R. I.
American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Babcock & Wilcox Co.....New York.
Bath Iron Works, Ltd.....Bath, Me.
Boyer's Sons, L.....New York.
Chicago Ship Building Co.....Chicago.
Clyde Machine Works.....Chicago.
Columbia Iron Works .....Port Huron.
Cramp, Wm. & Sons.....Philadelphia.
Crescent Ship Yard Co .....Elizabethport, N. J.
Delauney Belleville & Co.....St. Denis, France.
Detroit Shipbuilding Co.....Detroit.
Fletcher, W. & A. Co.....Hoboken, N. J.
Fore River Ship & Engine Co.....Quincy, Mass.
Forest City Boiler Co. .....Cleveland.
Jenks Ship Building Co.....Port Huron, Mich.
Kingsford Foundry & Machine Works..Oswego, N. Y.
Lake Erie Boiler Works.....Cleveland.
MacKinnon Mfg. Co.....Bay City, Mich.
Maryland Steel Co.....Sparrow's Point, Md.
Milwaukee Dry Dock Co. .....Milwaukee.
Moran Bros. Co.....Seattle, Wash.
Mosher, Chas. D.....New York.
Neafie & Levy Ship & Engine Building Co...Phila.
Newport News Ship Building Co..Newport News, Va.
Pusey & Jones Co.....Wilmington, Del.
Risdon Iron Works .....San Francisco.
Roberts Safety Water Tube Boiler Co...New York.
Stirling, The Co.....Chicago.
Superior Ship Building Co.....Superior, Wis.
Taylor Water Tube Boiler Co.....Detroit.
Union Machine & Boiler Co.....Cleveland.
United States Shipbuilding Co.....New York.
Warrington Iron Works.....Chicago.
Willard, Chas. P. & Co .....Chicago.

BOILER COMPOUNDS.

Dearborn Drug & Chemical Works.....Chicago.

BOILER RIVETS.

Bourne-Fuller Co.....Cleveland.

BOILER STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.

Falls Hollow Staybolt Co. .....Cuyahoga Falls, O.

BRASS AND BRONZE CASTINGS.

Cramp, Wm. & Sons .....Philadelphia.
Fore River Ship & Engine Co.....Quincy, Mass.
Lunkenheimer Co..... Cincinnati.
Macbeth Iron Co.....Cleveland.
Phosphor Bronze Smelting Co. .....Philadelphia.

BRASS—SHEET, ROD, ETC.

Waterbury Brass C .....New York.

BRASS WORK, MARINE.

Farnan Brass Works .....Cleveland.

BRIDGES, BUILDERS OF

Scherzer Rolling Lift Bridge Co. .....Chicago.

BUCKETS, ORE AND COAL.

Bartlett & Snow Co., C. O. .....Cleveland.
Brown Hoisting & Conveying Machine Co. Cleveland.
Lake Erie Boiler Works.....Cleveland.
Wellman-Seaver-Morgan Co..... ....Cleveland.

CABIN AND CABINET FINISHING WOODS.

Martin-Barriss Co.....Cleveland.

CAPSTANS.

American Ship Windlass Co.....Providence, R. I.
Hyde Windlass Co. .....Bath, Me.

CARPETS, RUGS, FURNITURE, ETC.

Sterling & Welch Co. .....Cleveland.

CEMENT, IRON, FOR REPAIRING LEAKS.

Smooth-On Mfg. Co. .....Jersey City, N. J.

CHAINS.

Standard Chain Co. .....Pittsburg.

CHAIN HOISTS.

Boston & Lockport Block Co. .....Boston, Mass.
Dake Engine Co. .....Grand Haven, Mich.

CHARTS.

Marine Review Pub. Co.....Cleveland.
Potter, J. D.....London.

CIRCULATOR, EQUILIBRIUM.

With Steam Heating Attachment.
Bloomsburg & Co., H. .....Baltimore, Md.

CLOCKS (Marine), CHRONOMETERS, BELLS.

Ashton Valve Co. .....Boston.
Bliss, John & Co. .....New York.
Chelsea Clock Co. .....Boston.
Ritchie, E. S. & Sons.....Brookline, Mass.

COAL PRODUCERS AND SHIPPERS.

Castner, Curran & Bullitt .....Boston.
Graham Coal & Coke Co., Ltd.....Detroit.
Hanna, M. A. & Co. .....Cleveland.
Pickands, Mather & Co. .....Cleveland.
Pittsburg Coal Co. .....Cleveland.
Rochester & Pittsburg Coal & Iron Co. ....Buffalo.

COAL AND ORE HANDLING MACHINERY.

Bartlett & Snow Co., C. O. .....Cleveland.
Brown Hoisting Machinery Co., (Inc.)...Cleveland.
Lidgerwood Mfg. Co.....New York.
Wellman-Seaver-Morgan Co..... Cleveland.

COMPASSES.

Bliss, John & Co. .....New York.
Ritchie, E. S. & Sons.....Brookline, Mass.

COMPASS ADJUSTER.

Fields, Capt. J. M.....Cleveland.

CONTRACTORS FOR PUBLIC WORKS.

Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co....Chicago.
Lake Erie Dredging Co..... Buffalo.
Smith Co., L. P. & J. A. .....Cleveland.

COPPER, TIN AND SHEET IRON WORK.

Lake Erie Boiler Works.....Cleveland.
McCutcheon, C. H.....Buffalo.
Topky Brothers .....Ashtabula, O.

COPPER—SHEET, TUBES AND ROD.

Waterbury Brass Co.....New York.

CORDAGE.

Baker & Co., H. H.....Buffalo.
DeGrauw, Aymar & Co.....New York.
Upson-Walton Co.....Cleveland.

CORK JACKETS AND RINGS.

Armstrong Cork Co. ....Pittsburg, Pa.
Kahnweiler's Sons, D. ....New York.
Lane & DeGroot ..... Long Island City, N. Y.

CHAIN CONVEYORS, HOISTS.

Bartlett & Snow Co., C. O. .....Cleveland.
Brown Hoisting Machinery Co., (Inc.)...Cleveland.
Chicago Pneumatic Tool Co. .....Chicago.
General Electric Co. .....Schenectady, N. Y.
Lidgerwood Mfg. Co.....New York.
Westinghouse Electric & Mfg. Co. .....Pittsburg.

DEAD-LIGHTS, AIR-PORTS, ETC.

"Long-Arm" System Co. .....Cleveland.

DIVING APPARATUS.

Morse, A. J. & Son.....Boston.
Schrader's Son, A. .....New York.

DOORS, WATER TIGHT, ETC.

Long Arm System Co.....Cleveland.

DRAWING MATERIALS.

Schwencke, Kirk & Co.....New York.

DREDGE ENGINES FOR HANDLING DUMP SCOW LINES.

Superior Iron Works .....West Superior, Wis.

DREDGING CONTRACTORS.

Buffalo Dredging Co ..... Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co....Chicago.
Lake Erie Dredging Co..... Buffalo.
Smith Co., L. P. & J. A. .....Cleveland.

DRILL PRESSES—DRILLS OF ALL KINDS.

Cleveland Punch & Shear Works Co. ....Cleveland.
Railway Appliances Co .....Chicago.

DRYING APPARATUS.

Buffalo Forge Co.....Buffalo.
Sturtevant, B. F. Co. .....Boston.

DRY DOCKS.

American Ship Building Co. .....Cleveland.
Atlantic Works .....East Boston, Mass.
Bath Iron Works, Ltd. .....Bath, Me.
Buffalo Dry Dock Co. .....Buffalo.
Chicago Ship Building Co. .....Chicago.
Craig Ship Building Co. .....Toledo, O.
Cramp, Wm. & Sons .....Philadelphia.
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Manitowoc Dry Dock Co.....Manitowoc, Wis.
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Milwaukee Dry Dock Co. .....Milwaukee
Moran Bros. Co. .....Seattle, Wash.
Newport News Ship Building Co. Newport News, Va.
Pusey & Jones Co. .....Wilmington, Del.
Shipowners Dry Dock Co. .....Chicago.
Superior Ship Building Co.....Superior, Wis.
United States Shipbuilding Co.....New York.

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Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
Lidgerwood Mfg. Co.....New York.
Westinghouse Electric & Mfg. Co. ..Pittsburg, Pa.

ELECTRIC HOISTS AND APPLIANCES.

General Electric Co. .....Schenectady, N. Y.
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Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

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ENGINE BUILDERS, MARINE.

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Atlantic Works .....East Boston, Mass.
Bath Iron Works, Ltd. .....Bath, Me.
Buffalo Forge Co. .....Buffalo.
Chicago Ship Building Co.....Chicago.
Chase Machine Co. .....Cleveland.
Columbia Iron Works .....Port Huron.
Craig Ship Building Co. .....Toledo, O.
Cramp, Wm. & Sons .....Philadelphia.
Crescent Ship Yard Co .....Elizabethport, N. J.
Dake Engine Co.....Grand Haven, Mich.
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Hall Bros. .....Philadelphia.
Jenks Ship Building Co. .....Port Huron, Mich.
Lockwood Mfg. Co. .....East Boston, Mass.
MacKinnon Mfg. Co. .....Bay City, Mich.
Maryland Steel Co. .....Sparrow's Point, Md.
Milwaukee Dry Dock Co. .....Milwaukee.
Moran Bros. Co. .....Seattle, Wash.
Mosher, Chas. D. .....New York.
Neafie & Levy Ship & Engine Bldg. Co. Philadelphia.
Newport News Ship Building Co. Newport News, Va.
Pusey & Jones Co. .....Wilmington, Del.
Risdon Iron Works .....San Francisco.
Roach's Ship Yard .....Chester, Pa.
Thropp, J. E. & Sons Co. .....Trenton, N. J.
Sheriffs Mfg. Co. .....Milwaukee.
Superior Ship Building Co.....Superior, Wis.
Trout, H. G. .....Buffalo.
United States Shipbuilding Co.....New York.
Warrington Iron Works .....Chicago.
Willard, Chas. P. & Co. .....Chicago

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Cory, Chas. & Son .....New York.
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ENGINEERING SPECIALTIES AND SUPPLIES.

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Lunkenheimer Co. ..... Cincinnati.
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Reilly Repair & Supply Co., James.....New York.

ENGINEERS, MARINE, MECHANICAL, CONSULTING.

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Gaskin, Edward .....Buffalo.
Hunt, Robt. W. & Co. .....Chicago.
Kidd, Joseph .....Duluth, Minn.
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Mosher, Chas D. .....New York.
Newman, R. L. .....New York.
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Powell, Ambrose V. .....Chicago.
Roelker, H. B. .....New York.
Sadler, Perkins & Field.....New York.
Wood, W. J. .....Chicago.

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Buffalo Forge Co. .....Buffalo.
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Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

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Macbeth Iron Co. .....Cleveland.

FLUE WELDING.

Fix's, S. Sons .....Cleveland.

FURNACES FOR BOILERS.

Continental Iron Works.....New York.

FUELING COMPANIES AND COAL DEALERS.

Castner, Curran & Bullitt (Pocahontas) ....Phila.
Graham Coal & Coke co., Ldt.....Detroit.
Hanna, M. A. & Co. .....Cleveland.
Pickands, Mather & Co. .....Cleveland.
Pittsburg Coal Co. .....Cleveland.
Rochester & Pittsburg Coal & Iron Co. ....Buffalo.
Smith, Stanley B. & Co. .....Detroit.
Smith Coal & Dock Co., Stanley B..... Toledo, O.
Youghiogheny & Lehigh Valley Coal Co...Chicago.

GASKETS, RUBBER.

New York Belting & Packing Co.....New York.

GAS BUOYS.

Safety Car Heating & Lighting Co. ..New York.

GAS AND GASOLINE ENGINES.

Chase Machine Co. .....Cleveland.

GAGES, STEAM AND VACUUM.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.
Lunkenheimer Co.. .....Cincinnati.

GRAPHITE.

Dixon Crucible Co., Joseph .....Jersey City, N. J.

HAMMERS, STEAM.

Chase Machine Co. .....Cleveland.

HARDWARE, SHIP.

Topky Brothers .....Ashtabula, O.

HATCH GEARS.

"Long-Arm" System Co. .....Cleveland.

HEATING APPARATUS.

Buffalo Forge Co. .....Buffalo.
Sturtevant, B. F. Co. .....Boston.

HOISTS FOR CARGO, ETC.

American Ship Building Co.....Cleveland.
Brown Hoisting Machinery Co., Inc. ....Cleveland.
Chase Machine Co. .....Cleveland.
Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....New York.
Hyde Windlass Co. .....Bath, Me.
Lidgerwood Mfg. Co.....New York.
Marine Iron Co. .....Bay City.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

HOSE FITTINGS.

Farnan Brass Works. .....Cleveland.

HOSE, RUBBER.

New York Belting & Packing Co.....New York.

HYDRAULIC MACHINERY.

Watson-Stillman Co., The.....New York.

ICE MACHINERY.

American Linde Refrigerating Co. .....New York.
Roelker, H. B. .....New York.

INDICATORS FOR STEAM ENGINES.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.

INJECTORS.

American Injector Co.....Detroit.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Lunkenheimer Co. .....Cincinnati.
Penberthy Injector Co. .....Detroit, Mich.

INSURANCE, MARINE.

Brown & Co. .....Buffalo.
Brown, W. W. .....Cleveland.
Dunham, R. J. .....Chicago.
Elphicke, C. W. & Co. .....Chicago.
Fleming & Co., P. H. .....Chicago
Hawgood & Co., W. A. .....Cleveland.
Helm & Co., D. T. .....Duluth.
Hutchinson & Co. .....Cleveland.
Insurance Co. of North America....Philadelphia
McCarthy, T. R. .....Montreal.
McCurdy, Geo. L. .....Chicago.
Mitchell & Co. .....Cleveland.
Peck, Chas. B. & W. F. ...New York and Chicago.
Richardson, W. C. .....Cleveland.
Sullivan, D. & Co. .....Chicago.
Weeks, F. H. .....New York.

IRON ORE AND PIG IRON.

Bourne-Fuller Co. .....Cleveland.
Hanna, M. A. & Co. .....Cleveland.
Pickands, Mather & Co. .....Cleveland.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Marine Construction & D. D. Co.....
.....Mariner's Harbor, S. I., N. Y.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Warrington Iron Works .....Chicago.
Willard, Chas. P. .....Chicago.

LIFE FLOATS.

Carley Life Float Co. .....New York.

LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong Cork Co. .....Pittsburg.
Drein, Thos. & Son .....Wilmington, Del.
Kahnweiler's Sons, D. .....New York.
Lane & DeGroot .....Long Island City, N. Y.
Marine Construction & Dry Dock Co.....
.....Mariner's Harbor, S. I., N. Y.

LIGHTS, SIDE AND SIGNAL.

Helvig, H. A. J. .....New York.
Russell & Watson .....Buffalo.

LOGS.

Negus, T. S. & J. D. ..... New York.
Nicholson Ship Log Co. .....Cleveland.
Walker & Sons, Thomas .....Birmingham, Eng.
Also Ship Chandlers.

LUMBER.

Martin-Barriss Co. .....Cleveland.
Moran Bros. Co. .....Seattle, Wash.
Shurick, F. S. .....New York

MACHINISTS.

Chase Machine Co. .....Cleveland.
Macbeth Iron Co. .....Cleveland.
Union Machine & Boiler Co.....Cleveland.

MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc. .....Philadelphia.

MACHINERY, NEW AND SECOND HAND.

Bowler & Co. Geo. H. .....Cleveland.
C e Machine Works.....Chicago.

MAN-HOLES, SWING DOORS, ETC.

"Long-Arm" System Co. .....Cleveland.

MARINE RAILWAYS, BUILDERS OF

Crandall & Son, H. I. .....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W. .....New York.

MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co. .....Cleveland
Bloomsburg & Co., H. .....Baltimore, Md.
Buffalo Forge Co. .....Buffalo.
Detroit Ship Building Co. .....Detroit.
Sturtevant, B. F. Co. .....Boston.

METALLIC PACKING.

American Metallic Packing Co. .....Cleveland.
Hayden Mfg. Co., N. L. .....Columbus, O.
Katzenstein, L. & Co. .....New York.
U. S. Metallic Packing Co. .....Philadelphia.

METAL POLISH.

Bertram's Oil Polish Co. .....Boston.

MOTORS, GENERATORS—ELECTRIC.

Buffalo Forge Co. .....Buffalo.
Electro-Dynamic Co. .....Philadelphia.
Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
"Long-Arm" System Co. .....Cleveland.
Sturtevant, B. F. Co. .....Boston.
United Marine Mfg. & Supply Co.....New York.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

NAUTICAL INSTRUMENTS.

Bliss, John & Co. .....New York.
Negus, T. S. & J. D. ..... New York.
Ritchie, E. S. & Sons .....Brookline, Mass.

NAVAL ARCHITECTS.

Gaskin, Edward .....Buffalo.
Kidd, Joseph .....Duluth, Minn.
Logan, Robert .....Cleveland.
Mosher, Chas. D. .....New York.
Newman, R. L. .....New York.
Sadler, Perkins & Field.....New York
Wood, W. J. .....Chicago.

OAKUM.

DeGrauw, Aymar & Co. .....New York.
Stratford Oakum Co.....Jersey City, N. J.

OILS AND LUBRICANTS.

Dixon Crucible Co., Joseph .....Jersey City, N. J.
Standard Oil Co. .....Cleveland.

PACKING.

American Metallic Packing Co. .....Cleveland.
Crane Co. .....Chicago.
Hayden Mfg. Co., N. L. .....Columbus, O.
Jenkins Bros. .....New York.
Katzenstein, L. & Co. .....New York.
New York Belting & Packing Co.....New York.
United States Metallic Packing Co. ....Philadelphia.

PAINTS.

Baker, Howard H. & Co .....Buffalo.
Berry Bros., Ltd. .....Detroit.
Mohawk Paint & Chemical Co.....Norwich, Conn.
New Jersey Zinc Co. .....New York.
Topky Brothers .....Ashtabula, O.
Upson-Walton Co. .....Cleveland.

PATENT ATTORNEYS.

Thurston & Bates .....Cleveland.

PATTERN SHOP MACHINERY.

Atlantic Works, Inc. .....Philadelphia.

PIPE—BRASS AND COPPER, IRON PIPE SIZE.

Waterbury Brass Co.....New York.

PIPE, WROUGHT IRON.

Bourne-Fuller Co .....Cleveland.
Crane Co .....Chicago.
Macbeth Iron Co.....Cleveland.

PLANING MILL MACHINERY.

Atlantic Works, Inc. .....Philadelphia.

PLUMBING, MARINE.

Mott, J. L., Iron Works .....New York.
Reilly Repair & Supply Co., James....New York.
Sands, Alfred B. & Son .....New York.

PNEUMATIC TOOLS.

Allen, John F., ... New York.
Chicago Pneumatic Tool Co. .....Chicago.

POLISH FOR METALS.

Bertram's Oil Polish Co.....Boston.

POWER DOORS AND HATCHES.

"Long-Arm" System Co. .....Cleveland.

PRESSURE REGULATORS.

Kieley & Mueller .....New York
Ross Valve Co. .....Troy, N. Y.

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BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

PROPELLER WHEELS.

American Ship Building Co. .....Cleveland
Atlantic Works .....East Boston, Mass.
Bath Iron Works, Ltd. .....Bath, Me.
Cramp, Wm. & Sons.....Philadelphia.
Crescent Ship Yard Co .....Elizabethport, N. J.
Detroit Ship Building Co. .....Detroit.
Fore River Ship & Engine Co. .....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Hyde Windlass Co. .....Bath, Me.
Jenks Ship Building Co. .....Port Huron, Mich.
Lockwood Mfg. Co. .....East Boston, Mass.
Macbeth Iron Co.....Cleveland.
MacKinnon Mfg. Co. .....Bay City, Mich.
Maryland Steel Co. .....Sparrow's Point, Md.
Milwaukee Dry Dock Co. .....Milwaukee.
Moran Bros. Co. .....Seattle, Wash.
Neafie & Levy Ship & Engine Bldg. Co.....Phila.
Newport News Ship Bldg. Co...Newport News, Va.
Phosphor Bronze Smelting Co., Ltd...Philadelphia.
Pusey & Jones Co. .....Wilmington, Del.
Risdon Iron Works .....San Francisco.
Roelker, H. B. .....New York.
Sheriffs Mfg. Co. .....Milwaukee.
Superior Ship Building Co.....Superior, Wis.
Thropp & Sons Co., J. E. .....Trenton, N. J.
Trout, H. G. .....Buffalo.
United States Shipbuilding Co.....New York.

PROJECTORS, ELECTRIC.

Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F. Mfg. Co. .....New York.
Clyde Machine Works .....Chicago.
Great Lakes Engineering Works.....Detroit.
Kingsford Foundry & Machine Wks. Oswego, N. Y.
Long Arm System Co. .....Cleveland.

PUNCHES, RIVETERS, SHEARS.

Chicago Pneumatic Tool Co. .....Chicago.

REFRIGERATING APPARATUS.

Roelker, H. B. .....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register .....Cleveland.
Record of American & Foreign Shipping.New York.

RELEASING HOOKS FOR DETACHING BOATS.

Standard Automatic Releasing Hook Co. New York.

RIVETS, STEEL, FOR SHIPS AND BOILERS.

Bourne-Fuller Co. .....Cleveland.

RANGES.

Russell & Watson .....Buffalo.

RIVETS—BRASS AND COPPER.

Waterbury Brass Co.....New York.

RUBBER INSULATED WIRES.

Roebling's Sons, Jno. A...New York and Cleveland.

SAFETY VALVES.

American Steam Gauge Co. .....Boston.
Ashton Valve Co.....Boston.
Hayden Mfg. Co., N. L.....Columbus, O.
Lunkenheimer Co. .....Cincinnati.

SAIL MAKERS.

Baker, Howard H. & Co. .....Buffalo.
Upson-Walton Co. .....Cleveland.
Wilson & Silsby .....Boston.

SALVAGE COMPANIES.

See Wrecking Companies.

SEARCH LIGHTS.

Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

SHEARS.

See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.

Bourne-Fuller Co. .....Cleveland.

SHIP BUILDERS.

American Ship Building Co. .....Cleveland.
Atlantic Works .....East Boston, Mass.
Bath Iron Works, Ltd.....Bath, Me.
Buffalo Dry Dock Co. .....Buffalo.
Columbia Iron Works .....Port Huron.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co. .....Toledo, O.
Chicago Ship Building Co.....Chicago.
Crescent Ship Yard Co .....Elizabethport, N. J.
Detroit Ship Building Co. .....Detroit.
Fore River Ship & Engine Co. .....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Jenks Ship Building Co. .....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Manitowoc Dry Dock Co.....Manitowoc, Wis.
Marine Construction & Dry Dock Co.....
.....Mariner's Harbor, S. I., N. Y.
Maryland Steel Co .....Sparrow's Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Moran Bros. Co. .....Seattle, Wash.
Neafie & Levy Ship & Engine Bldg. Co.....Phila.
Newport News Ship Bldg. Co....Newport News, Va.
Pusey & Jones Co. .....Wilmington, Del.
Risdon Iron Works .....San Francisco.
Roach's Ship Yard .....Chester, Pa.
Shipowners Dry Dock Co.....Chicago.
Smith & Son, Abram .....Algonac, Mich.
United States Shipbuilding Co.....New York.
Warrington Iron Works .....Chicago.
Willard, Chas. P. & Co. .....Chicago.

SHIP CHANDLERS.

Baker, Howard H. & Co. .....Buffalo.
Moran Bros. Co. .....Seattle, Wash.
Reilly Repair & Supply Co., James....New York.
Upson-Walton Co. .....Cleveland.

SHIP LANTERNS AND LAMPS.

Helvig, H. A. J.....New York.
Russell & Watson.....Buffalo.

SHIP TIMBER.

Martin-Barriss Co. .....Cleveland.
Moran Bros. Co.....Seattle, Wash.
Shurick, F. S. .....New York

SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co. .....Jersey City, N. J.

SPARS—LARGE SIZES.

Moran Bros. Co.....Seattle, Wash.

STAYBOLTS, IRON OR STEEL, HOLLOW, OR SOLID.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

STEAM VESSELS FOR SALE.

Elwell, Jas. W. & Co.....New York.
Holmes, Samuel.....New York.
King, Rufus S.....New York.
McCarthy, T. R.....Montreal, Can.
Newman, R. L.....New York.
Weeks, F. H.....New York.

STEAMSHIP LINES, PASS. AND FREIGHT.

American Line.....New York.
Cleveland & Buffalo Transit Co .....Cleveland.
Erie & Western Trans. Co. .....Buffalo.
Goodrich Trans. Co.,.....Chicago.
International Nav. Co.....Philadelphia.
Pere Marquette R. R. & S. S. Line.....Milwaukee.
Red Star Line.....New York.

STEEL CASTINGS.

Seaboard Steel Casting Co.....Chester, Pa.
Macbeth Iron Co.....Cleveland.

STEERING APPARATUS.

American Ship Building Co.....Cleveland.
Chase Machine Co. .....Cleveland.
Dake Engine Co.....Grand Haven, Mich.
Detroit Shipbuilding Co.....Detroit.
Electro-Dynamic Co.....Philadelphia.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.
Sheriff Mnfg. Co.....Milwaukee.

STOCKS, BONDS, SECURITIES.

Brown, W. W.....Cleveland.
Fahey & Co.....Cleveland.

SUBMARINE DIVING APPARATUS

Morse & Son, A. J.....Boston.
Schrader's Son, A.....New York.

SURVEYORS, MARINE.

Gaskin, Edward.....Buffalo.
Newman, R. L.....New York.
See, Horace.....New York.
Wood, W. J.....Chicago.

TESTS OF MATERIAL.

Hunt, Robert W. & Co.....Chicago.
Pittsburg Testing Laboratory, Ltd.....Pittsburg.

TILING, INTERLOCKING RUBBER.

New York Belting & Packing Co.....New York.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Allen, John F.....New York.
Chicago Pneumatic Tool Co.....Chicago.
Watson-Stillman Co.....New York.

TOOLS, WOOD WORKING.

Atlantic Works, Inc.....Philadelphia.

TOWING MACHINES.

American Ship Windlass Co.....Providence, R. I.
Chase Machine Co.....Cleveland.

TOWING COMPANIES.

Donnelly Salvage & Wrecking Co....Kingston, Ont.
Midland Towing & Wrecking Co., Ltd.Midland, Ont.

TRAPS, STEAM.

Kieley & Mueller.....New York.
Lunkenheimer Co.....Cincinnati.

TRUCKS.

Boston & Lockport Block Co..... .....Boston.

TUBING, SEAMLESS.

Shelby Steel Tube Co.....Pittsburg, Pa.
Waterbury Brass Co.....New York.

VALVES, STEAM SPECIALTIES, ETC.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.
Bordo, L. J.....Philadelphia.
Crane Co. .....Chicago.
Farnan Brass Works .....Cleveland.
Hayden Mfg. Co., N. L.....Columbus, O.
Jenkins Bros.....New York.
Kieley & Mueller.....New York.
Lunkenheimer Co.....Cincinnati.
Rose Valve Co. .....Troy, N. Y.

VALVES FOR WATER AND GAS.

Rose Valve Co. .....Troy, N. Y.

VARNISHES.

Berry Brothers, Ltd.....Detroit.
New Jersey Zinc Co.....New York.
Also Ship Chandlers.

VESSEL CASTINGS.

American Ship Building Co.....Cleveland.
Macbeth Iron Co.....Cleveland.

VESSEL FURNISHINGS.

Sterling & Welch Co. .....Cleveland.

VESSEL AND FREIGHT AGENTS.

Boland, John J.....Buffalo.
Brown & Co.....Buffalo.
Brown, W. W.....Cleveland.
Dunham, R J. .....Chicago.
Elwell, Jas. W. & Co.....New York.
Elphicke, C. W & Co.....Chicago.
Fleming & Co., P. H. .....Chicago.
Hall & Root.....Buffalo.
Helm & Co., D. T. .....Duluth.
Hawgood & Co., W. A.....Cleveland.
Holmes, Samuel.....New York.
Hutchinson & Co.....Cleveland.
King, Rufus S.....New York.
McCarthy, T. R.....Montreal.
Newman, R. L.....New York.
Mitchell & Co.....Cleveland.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.
Weeks, F. H.....New York.

VENTILATING APPARATUS FOR SHIPS.

Buffalo Forge Co. .....Buffalo.
Sturtevant, B. F. Co.....Boston.

WIRE—BRASS AND COPPER.

Waterbury Brass Co.....New York.

WIRE ROPE AND WIRE ROPE FITTINGS.

Baker, H. H. & Co.....Buffalo.
DeGrauw, Aymar & Co. .....New York
Upson-Walton Co.....Cleveland.

WHISTLES, STEAM.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.
Farnan Brass Works .....Cleveland.
Lunkenheimer Co.....Cincinnati.

WHITE METAL—SHEETS, RODS AND WIRE.

Waterbury Brass Co.....New York.

WINDLASSES.

American Ship Windlass Co.....Providence, R. I.
American Ship Building Co. .....Cleveland
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.

WINCHES.

American Ship Windlass Co.....Providence, R. I.
Hyde Windlass Co.....Bath, Me.

WOOD WORKING MACHINERY.

Atlantic Works, Inc.....Philadelphia.

WRECKING AND SALVAGE COMPANIES.

Donnelly Salvage & Wrecking Co....Kingston, Ont.
Midland Towing & Wrecking Co., Ltd.Midland, Ont.

YACHT AND BOAT BUILDERS.

Drein, Thos. & Son.....Wilmington, Del.
Lane & DeGroot.....Long Island City, N. Y.
Marine Construction & Dry Dock Co. ...New York.
Truscott Boat Mfg. Co. .....St. Joseph, Mich.
Warrington Iron Works.....Chicago.
Willard, Chas. P. & Co.....Chicago.

YAWLS.

Drein, Thos. & Son.....Wilmington, Del.
Lane & DeGroot.....Long Island City, N. Y.

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Eastward.	Arrive from West	Depart East.
No. 18, Southwestern Lim	.....	1:50am
No. 22, Lake Shore Lim...	*2:15am	*2:20am
No. 20, Chi & Cleve Ex....	*7:20am	.....
No. 28, N Y & Bost Ex ..	*7:40am	*8:00am
No. 40, Toledo & Buff Ac.	†10:00am	†10:40am
No. 32, Fast Mail	*11:25am	*11:30am
No. 44, Ac via Sandusky..	†1:40pm	..
No. 46, Southwestern Ex.	....	*3:00pm
No. 106, Conneaut Accom	.....	†4:30pm
No. 6, Lim Fast Mail....	*5:40pm	*5:45pm
No. 26, 20th Cent L.m. ...	*7:40pm	*7:43pm
No. 10, C., N Y & B Sp....	*7:30pm	*7:50pm
No. 16, New Eng Ex.....	*10:30pm	*10:35pm
No. 2, Day Express.	†9:10pm	†9 25pm
No. 126, Norwalk Accom.	†7:50am	.....

Westward.	Arrive from East.	Depart West.
No. 11, Southwestern Lim	*3:25am	....
No. 7, Day Express.	.....	†6:10am
No. 15, Bost & Chi Sp.....	*3:10am	*3:15am
No. 19, Lake Shore Lim..	*7:15am	*7:20am
No. 23, Western Express.	*10:30am	*10:35am
No. 33, Southern Express	*12:25pm	....
No. 133, Cleve & Det Ex..	.....	*12:45pm
No. 47, Accomodation.....	†11.2.am	†3:00pm
No. 141, Sandusky Accom.	.....	†3:10pm
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No. 37, Pacific Express...	*7:00pm	*7:20pm
No. 3, Fast Mail Lim.....	*10:50pm	*10:55pm
No. 115, Conneaut Accom.	*8:30am	.....

*Daily. †Except Sunday.
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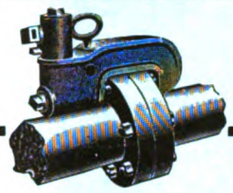

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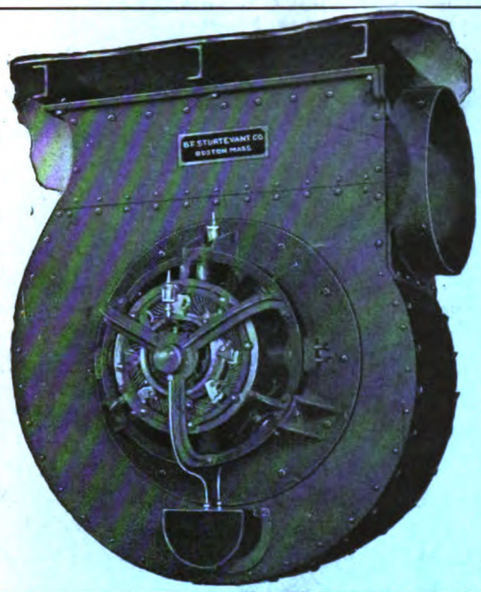

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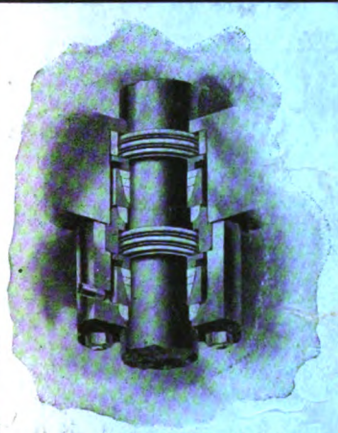

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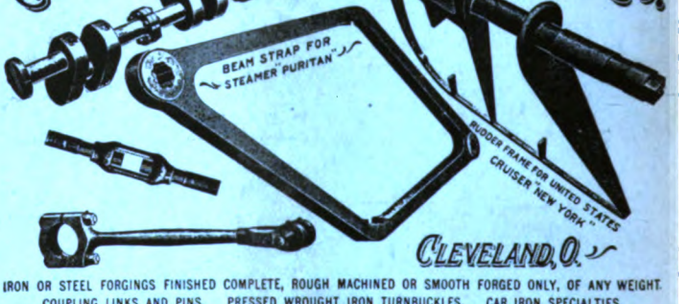

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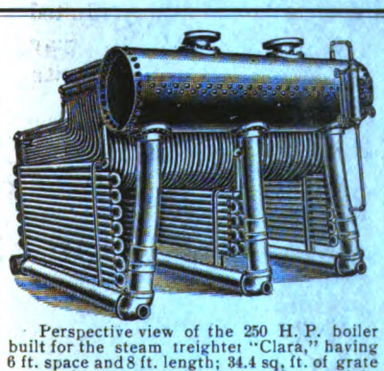

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